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CONTENTS.

ORIGINAL COMMUNICATIONS.

	PAGE
Cardiac Complications in Gonorrhœal Rheumatism. By R. L. MACDONNELL, M.D.	1
The Organization of an Operation. By W. W. KEEN, M.D.	11
The Modern Treatment of Sciatica. By WILLIAM BROADBUS PRITCHARD, M.D.	22
Notes on Six Cases of Perineal Section. By J. WILLIAM WHITE, M.D.	28
Complete Sclerosis of Goll's Columns and Chronic Spinal Leptomeningitis. By FREDERICK W. MOTT, M.D.	36
Antisepsis and Asepsis before and after Major Gynecological Operations. By HOWARD A. KELLY, M.D.	44
The Surgical Treatment of Aneurism of the Arcus Aortæ, with a Case Cured by the Loretta-Barwell Method. By JULIUS ROSENSTIRN, M.D.	55
The Corrosion Method in the Study of the Anatomy of the Ear. By B. ALEXANDER RANDALL, A.M., M.D.	58
Some Important Points Regarding the Appendix Vermiformis. By JOHN FERGUSON, M.A., M.D., L.R.C.P. Edin. etc.	61

REVIEWS.

The Science and Art of Obstetrics. By Theophilus Parvin, M.D., LL.D.	63
Progressive Exercises in Practical Chemistry. By Henry Leffmann, M.D., Ph.D., and William Beam, M.A.	66
Essentials of Minor Surgery, etc. By Edward Martin, A.M., M.D.	66

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

	PAGE		PAGE
Antisepsis of the Intestines	67	Amylhydrate	71
Therapeutic Action of Euphorine	68	Treatment of Diphtheria	71
Treatment of Diarrhœa	69	Iodine for Vomiting	72
Tracheal Injections as a Way of Administering Remedies	70	Solution of Iodoform in Olive Oil	72
Salipyrin	70	Salt for Stings	72
Resorcin in Diphtheria	71	Acute Poisoning from Antipyrine	72
		Carbolized Oil Externally	73

MEDICINE.

The Recognition of the Gonococcus	73	Value of the Phenylhydracin Test	76
The Contagiousness of Lepra	74	Chronic Constipation	76
Two Cases of Friedreich's Ataxia	74	Cardio-vascular Vertigo	77
Weil's Disease	75	Vertigo of Bulbar Origin	78
The Amœba Coli in Dysentery	75		

SURGERY.

Gunshot Wounds of the Chest and Wrist	80	Cholecystotomy	82, 83
Cyst of the Pancreas	80	Deformities Due to Paralysis	83
Tait's Flap-splitting Operation	81	Treatment of Hip-joint Disease	84
Brain Surgery	82	Lateral Deviation of the Spine	85
		Muscle-transplantation	85

OTOLOGY.

	PAGE		PAGE
Bezold's Form of Mastoid Disease		Ruptures of the Membrana Tympani;	
and Thrombosis of the Lateral Sinus	86	Forensic Importance	87

OPHTHALMOLOGY.

Isolated Bilateral Ptosis	88	The Form and Size of the Intra-vaginal Space of the Optic Nerve in the Region of the Canalis Opticus	90
New Treatment of Sympathetic Ophthalmitis	89	Visual Disturbances Due to Malaria .	91
Pupillary Changes Dependent upon Tubercular Disease of the Lungs .	90	Tenonitis following Influenza . . .	91

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

Epithelial Sarcoma of the Nasal Passages	91	Ozena	94
A New Method of Nasal Irrigation .	93	Hyperplasia of the Thymus Gland .	94
Hypertrophies of the Turbinates .	93	Menstrual Influence on Laryngeal Disease	94
Empyema of the Sphenoidal Sinus .	94		

DERMATOLOGY.

Prurigo Infantum; Psoriasis-eczema; Primary Pigmented Sarcoma of the Skin; Xeroderma Pigmentosum; Dermatitis Herpetiformis	95	Nature and Treatment of Eczema .	95
		Treatment of Lupus Vulgaris . . .	96
		Pilocarpine in Dermatology . . .	96
		The Use of Thiol in Skin Diseases .	97

OBSTETRICS.

The Pathology of Tubal Pregnancy .	97	The Prognosis of Labor and the Puerperal Condition in Old Primiparae under Antiseptic Precaution . . .	99
Pernicious Vomiting in Pregnancy .	97	The Transmission of the Bacilli of Typhoid of Mother to Fetus . . .	99
The Influence of Methods of Examination and Conduction of Labor upon Puerperal Mortality	97	Indications for the Induction of Labor	100
Menstruation and Pregnancy after the Removal of Both Ovaries . . .	98	Operative Treatment of Eclampsia .	100
Repeated Tubal Gestation	98	Pregnancy Complicated by Tumors .	100
Treatment of Lingering Labor . . .	98		

GYNECOLOGY.

The Etiology of Fibro-myoma	101	Iritis Catamenialis	103
The Treatment of Ovarian Cysts . . .	101	Prolapse of the Urethral Mucous Membrane in Young Girls . . .	103
Vuillet's Method of Dilating Uterus .	101	Treatment of Cancer of the Uterus .	104
Extirpation of Bladder in the Female	101		

PÆDIATRICS.

The Buccal Phenomena and Complications of Measles in Children . . .	104	Sydenham's Chorea	106
Croupous Pneumonia in Children and its Treatment	105	The Operative Treatment of Chronic Hydrocephalus	106

PUBLIC HEALTH.

The Microbe of Malaria	107
----------------------------------	-----

KOCH'S TREATMENT OF TUBERCULOSIS.*(Special Cable Dispatch from Berlin.)*

It will be remembered that Prof. Robert Koch made a preliminary announcement at the Berlin Congress concerning certain experiments he had undertaken which promised to provide a specific against tuberculosis; and that since then, not only the medical profession, but the civilized world has been in a state of anxious attention. On November 14, 1890, Professor Koch considered himself warranted in making an announcement in the *Deutsche medicinische Wochenschrift* which has made Berlin the Mecca for cases of phthisis as well as for physicians of both continents. The *Therapeutische Monatshefte* publishes a supplement containing reports by Doctors Feilchenfeld, von Bergmann, and Fräntzel, which bring our information down to November 17th. Gerhardt gave a lecture on November 18th, of which the *British Medical Journal* contains a brief notice. The special correspondent of THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES cables from Berlin, under date of December 8th:

"So far as we can learn, the material which is used by injection for the cure of tuberculous disease is itself a product of the action of the tubercle bacillus upon a culture-medium, the composition of which has not yet been made known, under conditions which are also still unrevealed. It probably contains, in addition to the *toxine* or *toxines* to which its activity is due, a minute quantity of cyanide of gold, as a protective against possible contamination with the bacilli themselves. 'Koch's lymph,' as it is called, is prepared for use in the following manner: One gramme of the lymph, with nine grammes of a two-per-cent. carbolic acid solution, constitutes the first (ten per cent.) dilution, from which a second (one per cent.) dilution is made in a similar manner—nine grammes of carbolized solution being added to one gramme of the diluted lymph; and from this again a third (one-tenth per cent.) dilution is made—one gramme of twice-diluted lymph to nine grammes of carbolized solution. This third dilution then contains one part of the lymph in one thousand parts of the

preparation, so that a dose of one gramme of fluid contains one milligramme of the lymph. As a rule, the patient is subjected first to this dose. Should no effect be produced by repeated doses, the amount is increased to a dose not exceeding six centigrammes. Koch always makes use of a freshly-prepared solution.

"Introduced into the stomach the remedy has no effect; it is, therefore, injected subcutaneously by means of the small syringe suggested by Koch for bacteriological work; the site of injection is the skin of the back between the shoulder-blades and the lumbar region, or, more recently, in the gluteal region. From three to eight hours after the injection, the effects begin to be manifested. They vary greatly in different subjects, and are said not to occur at all unless tuberculosis is present. The presence or absence of 'reaction' then is assumed to be a diagnostic sign, and this test was made use of by Gerhardt and von Bergmann to discriminate between cancer and tuberculosis of the larynx; and more recently between tuberculosis and syphilis of the palate. Upon the same principle, a patient who no longer manifests reaction after receiving the maximum dose of the remedy is assumed to be cured, though, for the present, Dr. Koch and his assistants very wisely speak of provisional cure only, as sufficient time has not yet elapsed to test its permanency.

"Among the provisional cures are cases of lupus, of tuberculosis of the larynx, of incipient phthisis, and of white swelling in children. Children stand the treatment well if care be taken not to begin with too large a dose.

"Reaction is manifested both by local and constitutional symptoms: the latter comprise pain in the limbs, fever, sometimes chill, nausea and vomiting, in phthisical cases cough and dyspnoea, and in a few cases sensorial disturbances such as somnolence and delirium. The fever may rise as high as 40° or 41° C., in which event great cardiac depression and even collapse are likely to occur. Sometimes the temperature suddenly falls to 36° or even 35.5° C. During the next day, however, there is a slight elevation of temperature to 37.8° or 39° C., called by Koch the 'secondary reaction.' The temperature again sinks below normal when the second stronger injection is given, which is followed by high fever as before.

"The local manifestations consist in swelling and discoloration of

the affected tissues, which finally necrose, and are either spontaneously expelled, or must be removed by surgical means.

"In cases of lupus, the local reactions, which are easily observed, have been very striking. The affected tissues become very red and swollen, surrounded by a raised border sharply defined, usually dark red in color, in some cases whitish, and varying from the breadth of a few millimetres to that of a finger.

"After the subsidence of the fever, the swelling of the lupus-tissue gradually decreases and disappears. The lupus-spots are covered by a soft deposit which desiccates into a crust; the crusts falling off, clean, red cicatrices are left. Of one case Feilchenfeld says that the pathological tissue seemed to have been removed as with a punch.

"If local reaction is observed in sites previously thought to be healthy, it is held to indicate the presence of unsuspected tuberculous disease. In many cases of lupus this has been a marked feature of the progress of the case toward recovery.

"As already stated, the symptoms of the reaction vary greatly in different individuals and in different forms of tuberculous disease.

"A slight punctiform rash sometimes appears over the whole of the body. In some cases a slight amount of albuminuria has been noted.

"The physiological disturbance from a given dose is greatest in acute cases. As recovery progresses, the dose necessary to produce reaction must be progressively increased, until finally, when the largest dose—six centigrammes—fails to produce reaction, cure is assumed to be complete. Cases of surgical tuberculosis begin to react only under a dose of five milligrammes or more. Until now the injections have been administered on alternate days, so that the effects might be better studied; but Koch maintains that the more rapid and intense the treatment, the more rapid and safe must be the cure, and the intervals between the injections will probably be diminished.

"The injections must be supplemented by the best possible hygiene and measures calculated to promote nutrition generally. Especially is this necessary in cases of suppurative joint-disease. In these cases, too, the 'cure' progresses slowly, and surgical interference is requisite to complete it.

"The action of the lymph seems to be the destruction of tuberculous tissue, and the constitutional disturbances seem to be correlated

with this process. The more extensive the lesions the more pronounced are the disturbances; and hence the smaller the initial dose which will excite reaction, but the greater number of repetitions of the injections, and the larger the final dose required, before the reaction ceases to be manifested. Extreme caution is evidently necessary to avoid dangerous constitutional reaction in cases of widely-disseminated tuberculosis; and where the locations of the lesions are such that the local reaction might jeopardize life, the treatment is contra-indicated. Thus, at least three conditions may be enumerated in which recourse to the method must be pronounced unjustifiable:

"1st. Advanced pulmonary tuberculosis.

"2d. Severe laryngeal tuberculosis.

"3d. Tuberculosis of the brain or meninges.

"But even in apparently mild cases there may lurk unsuspected dangers. A man who had for a short time exhibited symptoms of pulmonary tuberculosis, received in three days two injections, the first of two milligrammes, and the second of three milligrammes, of the lymph. Reaction was excessive, and five days later he died.

"Slight cavities were found at one apex, both lungs were hepatized and were infiltrated throughout with miliary tubercles. It is conjectured that the hepatization was the effect of the local reactions at the numerous foci offered by the disseminated miliary tubercles: this theory assumes the previous existence of these latter, but who shall say that they were not produced by the injections? The time is not too short to have permitted this. At all events, death seems to have been directly due to the treatment.

"In a private conversation held with Koch to-day, he said that though the Government now reserves the right of preparing the lymph, in a short while all applicants would be supplied. It is my impression that Koch desires the method to be firmly established before any doubts could be cast upon it by impure or otherwise imperfect lymph, which source of danger is now eliminated by the stand taken by the German Government. At present it is impossible to procure the article and more than five thousand applications have already been filed for it. Hundreds of doctors from the world over are returning home satisfied with the results demonstrated, but with only the hope of receiving the lymph at some future time."

THE
AMERICAN JOURNAL
OF THE MEDICAL SCIENCES.

JANUARY, 1891.

CARDIAC COMPLICATIONS IN GONORRHOEAL RHEUMATISM.¹

BY RICHARD LEA MACDONNELL, B.A., M.D.,

PROFESSOR OF CLINICAL MEDICINE, M'GILL UNIVERSITY; PHYSICIAN TO MONTREAL GENERAL HOSPITAL.

INASMUCH as many are in doubt as to whether gonorrhœal rheumatism ever affects the heart, I propose to review briefly the literature of the subject, to give the results of a critical examination of the histories of twenty-seven cases of gonorrhœal rheumatism, and to relate somewhat in detail the history of a remarkable case in which I believe the urethral affection was closely connected with the morbid processes which subsequently attacked the pericardium, the endocardium, and the pleura.

I shall not deal with the question as to whether gonorrhœal rheumatism exists, whether the affection we know by that name is a real rheumatism, or whether, if it be a rheumatism, it is caused by a gonorrhœa. I shall merely state that there is a form of joint affection associated with a discharge from the urethra, and that this joint affection differs from ordinary acute or subacute rheumatism in certain characteristics, one of which is said to be that it is never associated with affections of the heart.

In English and American treatises little mention is made of the possibility of the connection. Howard, in his article on "Gonorrhœal Rheumatism" in Pepper's *System of Medicine*, speaks of the connection as being a point on which there is much difference of opinion. He admits

¹ A paper read at the annual meeting of the Canadian Medical Association at Toronto, Sept. 1890.

that cases have been reported which appear to have been authentic cases of gonorrhœal endocarditis, but remarks that it would be impossible at times to distinguish a polyarticular acute gonorrhœal rheumatism from ordinary acute articular rheumatism, and he mentions the possibility of the heart symptoms being due to pyæmia.

Cases have been from time to time recorded in the journals. The connection is alluded to by Davies Colley, who in an essay on "Gonorrhœal Rheumatism" in *Guy's Hospital Reports*, spoke of one form of the disease which he called the inflammatory form, and which is specially liable to attack fibrous structures not connected with joints, *e. g.*, plantar fascia, the sclerotic coat of the eyeball, the iris, the pericardium, and the endocardium, the attack on these last two being usually associated with gonorrhœal arthritis.

In an article on the same subject in the same publication Dr. Pyc Smith analyzed the histories of twenty nine cases of gonorrhœal rheumatism and found that in one of them a basic systolic murmur was reported, which he passed over as being most probably of functional origin.

In 1884 a case was reported by Railton of a man, aged twenty-one, who after having suffered for six weeks from a gonorrhœal discharge, was attacked with sore throat, fever (102°), headache. Four days afterward there was pain in the right wrist and sour-smelling perspiration, but no cardiac implication. Two days after this there were evidences of endocarditis. He recovered after some weeks' illness, and the murmurs were said to have disappeared.

The subject is dealt with more fully by French writers. Marty, in 1876, published an article in the *Archives Générales de Médecine*, in which the literature of the subject up to date was reviewed and the histories of nine cases were given as well as one which he observed himself. One of these cases is of particular interest, as it resembles my case in the comparative insignificance of the joint affection. It is that reported by Lacassagne. The patient was a young man who entered hospital with diarrhœa as well as a gonorrhœa. Two days after admission there was sudden pain in the chest, physical signs of endocarditis, and elevation of temperature. No joint pain was observed.

Marty's own case presented the following history:

D., aged twenty-two. No rheumatic or cardiac antecedents. When five years old he was subject to palpitations, but for several years past he has been in the habit of lifting heavy weights without any trouble. In the fifth week of his gonorrhœa he had repeated rigors and intense headache, and a few days afterward it was noticed that there was a systolic murmur at the base of the heart. This was followed by a rise of temperature, presternal pain and vomiting followed by palpitation. The patient eventually recovered, though the murmur remained.

Marty's general conclusions are as follows:

Gonorrhœa may be complicated with inflammation of all the serous membranes, and may act in a direct way on each of them. Rheumatism is by no

means a necessary middle term between the specific lesion and the lesion of the serous membrane, although the cases of coexistence of the two complications are most frequent. The cardiac complications are rare. Of the several orifices the aortic one is most commonly attacked. Endocarditis appears to have occurred as frequently as pericarditis, if not more so.

In 1884 a case was recorded by MM. Derignac and Moussons in the *Gazette Médicale de Paris*:

A man, aged twenty-five, in the fourth week of his gonorrhœa was seized with pain in his left shoulder which soon shifted to his right shoulder and there remained. No other joint was affected. There was no previous history of joint affections, or family history of rheumatism. He had never had scarlet or typhoid fever, and he presented no signs of syphilis, alcoholism, or chorea. Two weeks later there was a sudden rise of temperature (102.6° F.), with cardiac distress. Well-marked systolic murmur. The symptoms subsided but the bruit remained, and there was subsequent atrophy of the deltoid and brachial muscles.

In Germany the subject has attracted more attention than elsewhere, several important monographs having been published during the last twenty years by Nolen, Pfuhl, Loeb, Guntz, and others. The first of these has collected fifteen cases of so-called heart complications. I have not been able to see this monograph, but I infer from the criticism of Loeb that the writer includes cases in which no further evidences of cardiac disease existed than reduplication of the first sound. Such cases cannot be included under the category of organic lesions, and the number of his cases must therefore suffer reduction.

Quite recently the subject has been dealt with somewhat exhaustively by Gluzinski, an abstract of whose paper is given in the Vienna correspondence of the *British Medical Journal* for the early part of 1889. It is stated that Brande, in 1854, published two cases of endocarditis and pericarditis, respectively, in connection with gonorrhœal rheumatism, and that Sigmund, in 1858, published two cases. Gluzinski himself collected thirty-one cases, and derived from them the following conclusions: 1. Pericarditis as well as endocarditis might supervene in the course of gonorrhœa. 2. These may develop after gonorrhœal rheumatism, but also without the presence of such an affection. 3. The complaint sometimes assumes the character of a severe infectious disease, as in endocarditis ulcerosa, and runs an acute course, and sometimes gives rise to failure of the heart. Gluzinski believes that the endocarditis is the result of the action of microorganisms on the valves, and he quotes a case published by Weichselbaum where gonorrhœa was complicated with endocarditis and cardiac failure, and the streptococcus pyogenes was found in the vegetations of the valves.

In eight of Gluzinski's cases the symptoms were mild. The patients complained of "stitch" in the left chest and palpitations. There was accelerated and increased action of the heart, and frequently also a slight pericardial râle. In the majority rheumatism was either quite

missed or it came on after the cardiac affection had set in. In all the patients there was gonorrhœa of long standing.

This is, therefore, a summary of the literature of the subject. I pass on to what is more interesting—namely, clinical experience.

The medical case-books of the Montreal General Hospital for the last eight years contain the histories of twenty-seven cases—twenty-six males and one female—which have been diagnosed as gonorrhœal rheumatism. Possibly some more cases of the kind may lie concealed among the numerous histories of so-called subacute rheumatism. Of these twenty-seven cases, physical signs of cardiac disease were present in six cases, but of this number two cases can be excluded on the ground that there was a history of acute rheumatism previously to the first attack of gonorrhœa. A history of scarlet fever in childhood, for a like reason, excludes a third case, leaving three cases in which it is probable that the heart affection depended upon a gonorrhœa.

CASE I. History of acute rheumatism in childhood, very probably with cardiac complications. In adult life a rheumatism, probably gonorrhœal. Systolic murmur present.—F. J., æt. twenty-five, laborer, admitted into the Montreal General Hospital June 3, 1888, under Dr. Wilkins, complaining of pain in both knees and in the left ankle. He has had attacks similar to the present one, the first when he was twelve years old, the second when he was nineteen. After the first of these attacks he began to suffer from palpitation and faintness on exertion. When twenty-three contracted a gonorrhœa for the first time, and six months ago contracted another. On admission the joints involved were painful, but not swollen or red. A urethral discharge is present. There is a soft, blowing systolic murmur, loudest at apex and transmitted as far as the axilla.

CASE II. History of acute rheumatism in childhood. Gonorrhœa at the age of eighteen, followed by arthritic pains. Evidences of disease of the mitral valve.—J. H., æt. nineteen, admitted May 24, 1885, under Dr. Wilkins. Pain and swelling of both knees. Thirteen years ago had acute rheumatism. Contracted gonorrhœa one year ago, and the discharge has been present ever since. Never suffered from dyspnoea. The present illness began six weeks ago, with pain in the right hip, then in the right knee and in soles of the feet. No history of exposure to cold. Pulse irregular and intermittent. No perspiration. Urethral discharge. The cardiac action is diffused. Apex displaced a little downward and outward, and cardiac dulness slightly increased. Loud, harsh presystolic murmur; a systolic murmur also. After a few days in hospital the pains subsided and the patient was discharged.

In these two cases I regard the occurrence of gonorrhœal rheumatism as accidental, and in no way connected with the valvular disease. It may be fairly assumed that in these patients the injury to the valve occurred in childhood. It is curious to note, however, that in both cases the rheumatism took the form most commonly found in connection with gonorrhœa, and not that of acute rheumatism. The fever was slight,

and there was no sweating. The joint affection was not general, and in one of the cases it was limited to one knee and one ankle; in the other to one hip, one knee, and the plantar fascia, and in neither case did any metastasis occur.

CASE III. Acute articular pains supposed to be of gonorrhœal origin. Evidences of cardiac enlargement and endocarditis. History of scarlet fever in childhood.—S. R., æt. twenty-six, a glassblower, was admitted to the General Hospital, April 23, 1890, under the care of Dr. Ross, complaining of pain in the left ankle and knee. He had had scarlet fever and measles in childhood, but he had never had rheumatism.¹ About a month or six weeks before admission he contracted a gonorrhœa; the discharge was copious, but had nearly ceased when the joint pains began. A week before admission he had been drinking and had been much exposed to the weather. The joints attacked were the knees, ankles, and elbows. The joint affection was not severe and subsided in four days.

State of the heart: The impulse is seen and felt one inch below, and half an inch outside the nipple. Dulness begins at the third rib above, and extends transversely from the border of the sternum to one inch outside the nipple. A faint systolic blowing sound can be heard at the apex, and one inch externally.

The patient left the hospital in one month, the joint affection having entirely subsided. There was evidently nothing like suppuration in the joint.

CASE IV. Two distinct attacks of gonorrhœa. Each followed by arthritis; the first by conjunctivitis and swollen testicle. No history whatever of rheumatism or of scarlet fever. Systolic murmur at the apex of heart.—J. McN., æt. twenty-four, admitted September 4, 1889, under Dr. Wilkins. Dull pain in left hip and ankle. Purulent urethral discharge. No history of rheumatism. Good health until two years ago, when he had an attack of gonorrhœa which was followed very soon by pains in the left ankle. He was laid up for four months, and was thought to have recovered completely. He was well until three months ago, when he had a new attack of gonorrhœa, followed as before by joint pains. The left ankle began gradually to be painful one week after the discharge appeared. At about the same time the right eye became painful and light became intolerable. He was treated for gonorrhœal ophthalmia in the out-patient department of the hospital. In five weeks the eye was well but the discharge was unchecked, and he suffered from obscure joint pains until a fortnight before admission, when the left hip became very painful. At the outset of the gonorrhœa the testicle had been swollen. There was no fever. Severe pain in left hip. Thick urethral discharge.

Heart: No increased area of dulness. A soft blowing systolic murmur was heard at the apex but was not transmitted in any direction. The patient left the hospital fairly well in about a fortnight.

There can be, in this case, no doubt of the gonorrhœal origin of the two articular attacks. There was no fever, no sweating. The attack was gradual, and there was never any severe pain. In his first attack

¹ No mention is made of his having suffered from cardiac symptoms previously to his admission to hospital.

but one joint was involved, and with it the conjunctiva, a most significant coincidence. In the second attack one hip and one ankle alone were attacked. There was no metastasis. The strongest evidence lies in the fact of the attack having followed twice in the course of a recent gonorrhœa.

The heart affection here was evidently a slow endocarditis possibly dating from the first attack, arising as it does in ordinary rheumatism without giving rise to symptoms, and so escaping attention.

CASE V. Gonorrhœal discharge of three weeks' standing. Acute arthritis in left elbow ending in suppuration and subsequent ankylosis. Endocarditis possibly recent. No history of rheumatism.—J. S., æt. twenty-one, admitted Sept. 30, 1887, under Dr. Ross. Exposure to cold three days previously followed by chills, slight sore throat, and transient pain in the right thumb. On the following day pain and swelling of left elbow-joint. Has never had rheumatism in any form. A gonorrhœal discharge present for the last three weeks. Has had no headache or sweating. On admission the fauces and uvula were found to be somewhat red, but there was no tonsillitis. Pulse 100; temp. 100.4°. Physical signs of lungs negative.

The apex-beat of the heart is in its usual position and the extent of cardiac dulness is not increased. A rough blowing systolic murmur is heard over the mitral area, most distinctly just over the apex. It is transmitted to the anterior axillary border, and can be heard at the back between the midline and the dorsal border of the scapula. A softer systolic murmur, blowing in character, is heard in the second intercostal space close to the left border of the sternum.

On the fourth day of the illness there were some fugitive pains in the left wrist. Temperature fell to normal. During the next fortnight the left elbow-joint became distended with fluid, which, on aspiration, proved to be pus. The case was transferred to the surgeons. The patient recovered with a stiff joint. During his stay in hospital the heart-murmur diminished in intensity but never disappeared.

There is nothing in this history to warrant the assumption that ordinary acute rheumatism was the cause of the heart affection. There is no history of a previous attack. Exposure to cold is well recognized as the exciting cause of gonorrhœal, as well as of ordinary acute rheumatism. A one-joint affection ending in suppuration can hardly be acute rheumatism. It must be either gonorrhœal rheumatism or a pyæmia, and it is highly probable that the distinction between these two morbid states is merely one of degree. Cases of gonorrhœal rheumatism ending in pyarthrosis are very rare but they have been described. Fifty years ago Vidal (de Cassis) mentioned this termination in his famous treatise on the venereal diseases and gave the particulars of a case ending like this in suppuration and ankylosis.

CASE VI. Gonorrhœa; rigors; slight joint pains; sudden and urgent dyspnoea; pericarditis; endocarditis; pleuritis; recovery with persistent mitral murmur.—D. B., æt. twenty-two, a merchant's clerk, of fair complexion,

short stature, and very muscular build, had always been in good health until May 8, 1890, when after a long, cold, wet drive he became thoroughly chilled, and when he alighted from the vehicle he noticed that his knees had become stiff and painful. He took some hot brandy and water and was obliged to go to bed immediately, feeling very ill and uncomfortable. He slept badly, owing to his chilly sensations as well as to the pains he felt in the knees. These pains were not very severe and were not relieved by resting—in fact, he found some relief in moving them about. On the following morning, though he felt tired and uncomfortable, he went to his office, but in the middle of the day he began to experience a sense of oppression in the chest and was obliged to rest that afternoon, though he did not take to bed. The next day was Saturday. He returned to the office in the morning, did all that was required of him, went home to dinner, and in the afternoon took part in the inspection of the volunteer corps to which he belonged. He felt a little stiff in the knees at starting but at that time felt no shortness of breath or cardiac pain. There was a great deal of marching about and as the afternoon wore on he felt very stiff in the knees and began then, for the first time, to feel pain in the wrist and the ankles. The next day being Sunday he rested in bed all day suffering merely from slight pains and stiffness in his knees, the pain having entirely left the wrists and ankles. On the following (the fifth) day on attempting to dress he found himself very short of breath, and during the day this distress increased rapidly. He found sitting more comfortable than lying and soon he could only breathe comfortably when standing. He now sought advice, and Dr. Herbert Reddy, who was summoned, found him in a state of urgent dyspnoea and breathing forty to the minute. The pupils were widely dilated, and he wore an expression of deep distress and anxiety. The pulse was rapid, but the temperature was not very high. There were no physical signs, and the joint symptoms had at that time completely disappeared. The general appearance was that of a patient in the early stage of a severe pneumonia.

On the afternoon of the following (sixth) day, when I saw him in consultation at Dr. Reddy's request, the patient was in less distress than on the previous day. There was still orthopnoea. Respirations were 36 and the temperature 99°. The resemblance to the appearance of a patient in the early stages of pneumonia was very remarkable, but there were no physical signs in the lungs. Over the base of the heart a double friction-murmur was distinctly audible, extending over an area of about an inch and a half in diameter, with its centre at the middle of the junction of the third costal cartilage with the sternum.

The heart's action was excited but regular, and there was no increase in the area of superficial cardiac dulness.

With such symptoms and physical signs a diagnosis of acute pericarditis was made, and it was not until this stage of the examination was arrived at and a cause for the pericarditis was sought, that he told us about the joint pains, and that he was suffering from a gonorrhoeal discharge of some five weeks' standing.

On the following day (seventh) the friction-murmur could not be detected. From the eighth to the tenth day of the illness, when he was under Dr. Reddy's care, the dyspnoea gradually subsided, and the friction-murmur was not again detected.

On May 18th (eleventh day) he was admitted to the Montreal

General Hospital, when the following condition was noted: Patient somewhat pale; pupils dilated; no manifest dyspnoea while at rest; respirations 20; no swellings of the joints; dorsal decubitus. The anxious expression observed at my first examination is no longer present. There is no constant cardiac pain or palpitations. The patient complains of pain merely when he takes a very long breath. The apex-beat of the heart is in its normal position. The heart's action is slow and deliberate. The area of superficial cardiac dulness is not increased, and there is no diminution of the intensity of the cardiac sounds. A systolic murmur is faintly audible at the apex, but it is not heard around the chest. At times when the patient is lying upon his back this murmur is not audible, but it becomes so when he sits up and leans forward. At the base of the heart both the cardiac sounds are quite clear; the pulse beats at 66, regular and compressible.

A urethral discharge has been present for the last six weeks. It had nearly ceased at the time he went out driving, but after the chilling it returned, owing, he thought, to the large quantity of hot brandy and water which was given to him at the time. This is his second attack of gonorrhœa, the first occurred some months previously, and was accompanied by a swollen testicle, but no joint pain. The urine is of normal quantity and specific gravity, and contains no albumin. Temperature 99°.

There is no evidence of any previous illness showing a tendency to rheumatic affections, no scarlet fever, no tonsillitis, no chorea.

Family history: With the aid of the patient's brother, who is a medical man, I was able to look into the family history thoroughly. On the father's side there is no trace of any rheumatic or gouty tendency whatever. On the mother's side, of five uncles and aunts of the patient, one aunt is the subject of heart disease, and the two sons of another aunt have had, the one a chronic affection of the heart and the other recurrent attacks of acute rheumatism.

June 2 (25th day). He has now been a fortnight in hospital, and up to to-day has been doing well. The temperature has been normal or nearly normal; the pulse quiet. There has been very little dyspnoea. The systolic murmur has been becoming more distinct, and it is now plainly audible in any position of the body. During the day the temperature rose to 100°, and he complained of epigastric distress.

4th (27th day). The evening temperature has gone just beyond 100° for the last three days. Pains in the back of the neck and about the shoulders. Flatus in abdomen troublesome.

7th (30th day). Temperature rises to above 100° at night, and last night it touched 101°. Pain on taking a long breath. Orthopnoea. No new physical signs.

8th (31st day). Evening temperature was 102°. Dulness on percussion at the base of the right lung, weakened breath sounds and diminished vocal resonance. At the left base there is a slight loss of resonance. The heart's action is now rapid, the sounds are somewhat muffled. Respiration 24.

9th (32d day). To-day a distinct to-and-fro murmur is heard over the præcordium, with its maximum intensity at the junction of the fourth costal cartilage with the sternum on the left side, and it is audible at any point within a radius of an inch and a half from here. The limits of cardiac dulness are not perceptibly increased. There is evidently

fluid in both pleura, for on both sides of the chest there is now flatness as far up as the angles of the scapulæ; breath-sounds absent. On the left side over the dull area there is very distant ægophony.

10th (33d day). The temperature reached its highest (104°) last night. Great restlessness and discomfort. Physical signs unchanged, except that the cardiac dulness is increasing toward the right side, extending to half an inch beyond the right border of the sternum.

He complains greatly of gastric eructations, and the cardiac pain and dyspnœa interfere with sleep.

12th (35th day). The temperature has been falling. Cardiac dulness is unchanged, but the to-and-fro murmur is no longer present. Sounds muffled.

13th (36th day). The sounds less muffled. A systolic murmur again audible just below the nipple.

18th (41st day). There is general improvement. Very slight rise of temperature in the evenings. Ægophony not so well marked. Systolic murmur now very plain.

July 9. Went to his home in the country to-day. From the date of last note he improved very rapidly, especially after he was allowed to move about. When he left the hospital the cardiac dulness was of normal extent, and though the ægophony entirely disappeared, there still remained a margin of dulness at both bases. The systolic murmur presented its old character, being limited strictly to the apex. The urethral discharge gradually disappeared.

Such is the history of the case which carries with it the greater part of the evidence I have to bring before you in favor of the view that gonorrhœal rheumatism may set up cardiac affections. A young man, not personally nor hereditarily disposed to rheumatism, in the fifth week of his second attack of gonorrhœa, is exposed to cold, suffers from a succession of rigors, followed by slight joint pains, chiefly in the knees, not of a character sufficiently severe to confine him to bed. After four days these transient joint pains leave him and he is suddenly attacked with præcordial pain and dypnœa. The physical signs of pericarditis are recognized. Nothing more is heard of the articular pains, but the urethral discharge continues and evidences of pericarditis disappear. On the thirtieth day of the illness fresh effusion takes place in the pericardium, and in the pleura the same process is noticed. Gradual absorption of effused fluid takes place. Finally, all physical signs disappear except a well-marked apex systolic murmur.

Either it was a case of gonorrhœal rheumatism in which the endocardium, pericardium, and the pleura were attacked, or it was an ordinary case of acute rheumatism with ordinary complications, and the gonorrhœa was merely an accidental circumstance. I believe that the gonorrhœa was the cause of the attack on the serous membranes, for these reasons:

1. There was no previous history of acute rheumatism nor of any rheumatic manifestations whatever; no tonsillitis, no chorea, no growing

pains. His mother assured me that up to the present illness he had been perfectly well.

2. The fact of cold having acted as an exciting cause in no way affects the probability of gonorrhœa having been the predisposing cause. In the twenty-seven cases of gonorrhœal rheumatism I have collected cold was put down as the exciting cause in seven, and this is no new observation.

3. Pyrexia was by no means prominent. For the first fourteen days the temperature scarcely went over 100°. At the time the pleurisy and pericarditis were discovered there was elevation, but not at the outset of the disease, as would most probably have been the case in ordinary acute rheumatism.

4. The joints were involved to a very slight degree. He was never obliged to take to bed on account of joint pains, and at the very height of the attack he was still able to walk about. The pain was mainly felt in the knees, and there was no metastasis. The wrists and ankles were merely stiff. We know that in children the joint affection of rheumatism bears no relation to the severity of the heart affection, but in adults one does not commonly see cardiac affections follow joint affections so slight as these were.

5. There was no sweating at any period of the disease.

The conclusions which may be drawn from this paper are as follows:

1. That a review of the literature of gonorrhœal rheumatism shows that although a considerable number of cases have been recorded to prove the connection between gonorrhœa and affections of the serous membranes, yet those histories which will bear close inspection are very few. In some, the actual presence of the heart lesion is open to doubt, and in others the existence of ordinary acute rheumatism cannot be excluded.

2. That although of remarkably infrequent occurrence, cases do occur where the poison of gonorrhœa attacks the endocardium, the pericardium, and the pleura as well as the fibrous structure of joints.

3. That if such be the case it is the duty of physicians to regard gonorrhœa in a more serious light; to confine patients to bed whenever the symptoms are at all severe, to examine more frequently the condition of the heart, and to ascertain in cases of chronic valvular affection where there is no history of acute rheumatism, whether a possible cause may exist in a bygone gonorrhœa.

My thanks are due to my colleagues, Drs. Ross, Wilkins, and Molson of the medical staff of the Montreal General Hospital, for permission to make use of their case-books, as well as to Dr. Vidal, my house physician, for the aid he afforded me in collecting the clinical histories used in the preparation of this paper.

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THE ORGANIZATION OF AN OPERATION.

By W. W. KEEN, M.D.,

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OUR text-books on surgery, in treating on Operations, give directions as to the need of an ample number of assistants and the assignment and nature of the duties of each, of preparing the room, etc.; but so far as I know, they do not insist on the proper method of organizing the operation as to the minute written or printed directions to the nurse and to the physician in charge in any systematic way. For the want of this the family, the physician, and the nurse do not know what is expected of each, and often the needed preparations are not made until the surgeon arrives in person.

In my earlier professional life, before doing an operation I was compelled to sit down and make a list of what was wanted, and also to give verbal or written directions to the nurse, the family, and the physician. At each operation this laborious process had to be repeated, and the chances were that I would forget some one or more of the details of the preliminary preparation, or some minor instrument or necessary appliance that I wanted during the operation. Gradually the matter systematized itself in my mind, and some twelve or fifteen years ago I prepared a blank somewhat similar to the one presented below. I have been so often asked for a copy of this blank that I have finally decided to publish it in this article, and in addition Messrs. Lea Bros. & Co. have kindly consented to publish the blank in pads of fifty each, so that they may be available to any surgeon who desires to use them. Probably others have adopted some more or less similar plan but I know of none that has been published.

My custom is, before each operation, to take one of these blanks, run over its items and check those that are applicable to the case. I then send or hand it to the physician in attendance, with the request that everything shall be prepared in accordance with it. If it is a private case of my own I hand it to the nurse and expect her to attend to the items of the first two divisions, and I check and so order from the drug-store such appliances, dressings, or drugs of the third and fourth divisions as I require.

OPERATION BLANK.

..... 18

For the operation on M (name and address)
on (date) at o'clock, please see that such of the
following preparations as are checked are all made beforehand.

..... M.D.

I. THE PATIENT.

1. The day before the operation shave the parts; scrub well over a wide area with soap and water; then with ether; then with sublimate solution, 1:1000; then apply a sublimate gauze dressing and bandage to remain until the operation.

2. See that the bowels are opened by a gentle purge given the previous evening, and if need be by a morning enema.

3. Wash out the vagina and rectum.

4. For breakfast a cup of clear soup (no bread or other solid food), and no food later.

5. Have the patient in bed (in an adjoining room, if possible) a half-hour before the operation, with night-dress, chemise or undershirt, drawers, and stockings only.

II. THE ROOM AND BED.

1. Take up the carpet, remove curtains, draperies, and all furniture except a bureau, washstand, table, and two cane-seat or wooden chairs; clean the room; clean the walls and ceiling with a brush or broom covered with a towel; then wash the floor, woodwork of walls, and furniture with carbolic solution, 1:40; have clean carpet strips ready to lay on the floor after the operation.

2. A firm four-legged table, with three old blankets and a pillow in front of a window (north light preferred).

3. Remove the window-curtains, and screen the lower sash by paper or towels.

4. Four toilet tables for instruments, dressings, etc.

5. Protect the floor.

6. Two blankets on the bed instead of sheets.

7. Protect the bed by rubber cloth and a draw sheet.

8. Ten hot-water bottles well corked.

9. Hoops to support the bed-clothes.

10. Waste water bucket.

11. Five china basins and one tin basin.

12. Three sheets and fifteen towels, to be wrung out of sublimate solution, 1:1000, the night before the operation and rough-dried.

13. Two dozen large safety-pins.

14. Tumbler, tablespoon, and teaspoon.

15. Nail-brush.

16. Two pitchers of cooled boiled water.

17. Plenty of hot water.

18. A sheet of stout wrapping-paper.

19. $1\frac{1}{2}$ yards white flannel.

20. Fresh clear soup and milk.

21. Olive oil, two ounces.

22. A half-pint of vinegar.

III. DRESSINGS, ETC.

1. One can of Am Ende's sublimate gauze.

2. One roll of Hartmann's wood-wool dressing.

3. A piece of "rubber dam" x inches.

4. Four bandages, inches wide.

5. Two ounces borated cotton.

6. $\frac{1}{2}$ pound of "Globe antiseptic wool."

7. Bed-pan.

8. Catheter.

9. Thermometer.

10. Hypodermatic syringe.

11. A bent glass feeding-tube.

IV. MEDICINES, ETC.

1. Carbolic acid (No. 1), fl \bar{z} vss in a half-gallon bottle of distilled water.
2. Carbolic acid (No. 1), fl \bar{z} vj.
3. Two $\frac{1}{2}$ pound cans Squibb's ether.
4. Chloroform, fl \bar{z} iv.
5. Liq. morph. sulph., fl \bar{z} j.
6. Four suppositories, 1 grain opium each.
7. Spirits ammon. aromat., fl \bar{z} ij.
8. Alcohol, Oj.
9. Ten-grain powders of sulfonal in no. 4.
10. Brandy, fl \bar{z} iv.
11. Lime-water, fl \bar{z} iv.
12. Sublimate tablets for 1:1000 solution, no. xx.

I would like to add a few words in explanation of some of these directions, lest they should be obscure or misunderstood.

PART I.

(4) For the meal before the operation I always prefer a cup of clear soup rather than milk, with no bread or other solid food. My reason for this is that the anxiety which is so common and so natural before an operation frequently disturbs the digestion to such an extent that even milk curdles in the stomach, is not digested, and is often vomited in large curds.

PART II.

(6) As after the operation the patient is apt to be in more or less of a condition of shock and to feel the cold, I always prefer that he shall lie between blankets instead of sheets.

(8) I always order ten hot-water bottles, well corked, three to be placed on each side of the patient, two or three between the legs, and one or two at the feet. After the patient is placed in bed and covered with the blanket these bottles are placed upon the upper blanket, and thus any danger of burning the skin is avoided.

(11) Of the five china basins I use one for washing the hands and forearms before beginning the operation, a second for alcohol to cleanse the hands with, a third for a hot bichloride solution for disinfecting the hands after the alcohol, a fourth (after disinfection) for sponges or their substitute (see below), and the fifth for a hot bichloride solution in which to wash my hands repeatedly during the operation. The tin basin is used in case the patient vomits, and is chosen on account of its light weight.

(12) The three sheets are folded about six feet long and eighteen

inches wide. About a foot of the upper end is turned under, the short end being next the chest, and hanging over a bandage which is tied around the neck. Another bandage around the waist secures the sheet to the body. I use these for myself and two assistants as substitutes for the ordinary aprons or operating-coats. My reasons for this are, first, because they are sterilized, and secondly, it gives me much less trouble to have the nurse look after this than it does to keep several of these coats or aprons and have them constantly washed and sterilized at home.

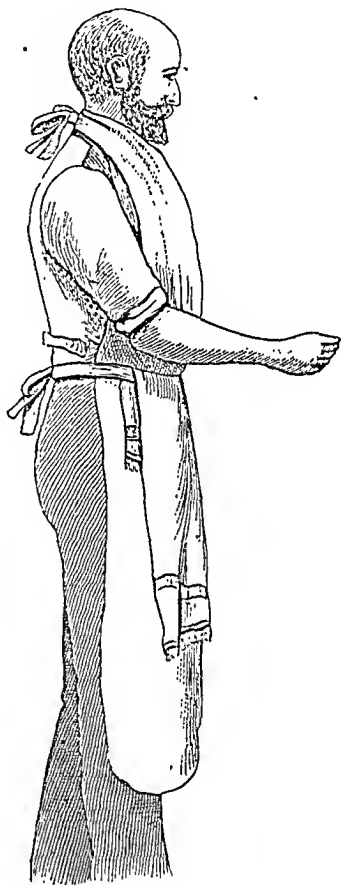
The towels, like the sheets, are to be sublimated so as to render them aseptic, and then are dried. I am persuaded that we often add needlessly to the shock of an operation by chilling our patients with the towels wrung out of a hot sublimate solution. These quickly cool, and in at least one, if not two instances, I could trace severe attacks of rheumatism to the use of the wet towels. It will be noticed therefore that the sublimated towels which I use are all dry. The entire field of operation is surrounded by them, and the arm or leg (and sometimes both) next the field of operation is wrapped with these sublimated towels, well secured by safety-pins. If the patient, then, in the ether-struggles happens to touch the part, it is by a disinfected towel rather than an infected arm or hand. Similarly in operations on the head or neck I pin one of these towels around the hair, and I also usually pin one around the inhaler.

(16) I have two pitchers of boiling water drawn on the morning of the operation and allowed to cool, so that I can dilute the hot water extemporaneously to any temperature desired with this cool, sterilized water.

(18) The wrapping-paper is for the purpose of making a hood for the Allis inhaler.

(19) The white flannel is for a binder, and in a breast case I always tear it lengthwise into two strips, each ten or twelve inches wide. One of these secures the dressing to the chest, and the other secures the

FIG. 1.



The author's mode of using a sterilized sheet instead of an apron, the upper end being turned next the chest and over the bandage around the neck. The towel and bandages are also sterilized.

arm of the operated side securely to the chest to obtain that essential, physical rest. I pin the two layers of flannel to each other behind the elbow in order to give support to the arm. A sling supports the forearm.

PART III.

(1 and 2) The sublimated gauze that I have found the most satisfactory is that made by Am Ende, of Hoboken, N. J. Any other make or Lister's double cyanide gauze may of course be ordered. I have lately used also with great satisfaction Hartmann's wood-wool dressing. I have had Dr. Coplin, the bacteriological assistant in the Jefferson Medical College Laboratory, examine this bacteriologically, and he has found it absolutely sterile. I rarely use sponges now, but more commonly cut up a half or a whole can of sublimate gauze into masses one-half to two-thirds the size of a fist and use them for sponges, throwing them away of course afterward. They may be used after Landerer's dry method, and even in cases where one does not wish to adopt this as a method I think the gauze mops are much less dangerous than sponges, no matter how carefully they are disinfected.

In the abdomen however I always use sponges, because in cutting the gauze there are apt to be loose threads on the margin which I should be unwilling to leave in the abdomen. The wood-wool dressing I have not found so advantageous for sponging. It may be used, it is true, in little bags of cheese-cloth, but they are more troublesome to make than the simple cutting of the sublimated gauze.

I always use my dressings dry.

(3) The rubber dam is the thin rubber tissue generally used by dentists and known to dealers by this name. Even with sublimate gauze I always use it, not, as in carbolic acid dressings, on account of the volatility of the antiseptic, but to prevent the soaking through of the discharge at the points opposite the drainage-tubes. The size of the rubber dam is suited to each case.

(6) Outside of the rubber I ordinarily use a mass of "Globe antiseptic wool." I find it the best means of securing an equable and elastic pressure.

PART IV.

(1) The solution of carbolic acid is a little more than 1 : 10, and is made of this strength in order that it may be extemporaneously diluted with hot water for the instruments. These I place in one or more tin trays and cover them as soon as I arrive with the carbolic acid solution diluted to 1 : 20. Just before beginning the operation, after they have been soaking ten to twenty minutes, I pour off all this solution and cover them with boiling water. By this means they are thoroughly disinfected, and at the same time the substitution of the boiling-water

prevents the destruction of the epidermis of my hands, which is one of the great objections to carbolic acid. The extra carbolic acid is to make more of the solution if desired, and as I always order the carbolic solution in a half-gallon bottle it can be made extemporaneously with sufficient accuracy. Scrubbing the hands with ordinary vinegar is the best means of removing blood, and neutralizes excellently any disagreeable effects of the carbolic acid. I owe this suggestion to Miss Dalziel, of the Orthopædic Hospital. In the Jefferson Hospital and elsewhere where I have a Schimmelbusch sterilizer I always use this instead of soaking the instruments in the carbolic solution, but in operations in private houses I find the carbolic acid more convenient and equally efficient. In the Jefferson Hospital we have also a Sattagast steam sterilizer for sheets, towels, gauze, etc., to be used instead of sublimating them. The Arnold sterilizer answers admirably also for this purpose and is much cheaper than the foreign makes. The largest size should be ordered. It is made of copper and costs \$10. A croup attachment comes with it.

(5 and 6) While I frequently order morphine and opium suppositories lest they be needed the night following the operation, as a matter of fact I very rarely have to use them. Antisepsis has almost abolished pain after operations, even the major ones.

(8) The alcohol is for the purpose of washing the hands and scrubbing the finger-nails after they have been cleansed with soap and water, and before cleansing them with the bichloride solution.

(9) I often give one or two ten-grain sulfoal powders the night before the operation, to overcome the natural apprehension a patient often feels and so secure a good night's sleep, and afterward, also, if necessary.

(14) The sublimate tablets are familiar now to the profession, and are by far the most convenient form of making extemporaneously the ordinary solution of 1:1000, or any other desired strength.

If the nurse understands her business as she ought, and follows the directions given, all the preparation will be made—the room and table all ready, the wrappers taken off the bottles, the corks sufficiently loosened, the lids of the cans of gauze loosened, and everything will be so arranged that the surgeon has only to prepare his instruments, needles, sutures, and gauze-sponges, and is ready to proceed without any loss of time to himself, his assistants, or his guests.

INSTRUMENTS.

In order that I may not forget any instrument or appliance, even the most trifling, I have made out for my own use the appended manuscript list of instruments, etc. Before an operation I run over each item, first in the "general list" of instruments, etc.; secondly, the list of instruments for the especial kind of operation to be done, and lastly, the "special list" of instruments. This requires only a few minutes, and

by it I am reminded always to see if any instrument or appliance has been omitted, and if the stock of such as are used up (silk, catgut, drainage-tubes, etc.) is exhausted, I am reminded to replenish it.

General List of Instruments, etc.

- | | |
|--|---|
| 1. General operating-case. | 15. Fountain syringe. |
| 2. Allis's inhaler. | 16. Large tin pans; small rubber pans. |
| 3. Tongue-forceps. | 17. Trocars |
| 4. Cocaine solution, 4 or 10 per cent. | 18. Long probes. |
| 5. Hemostatic forceps. | 19. Long hemostatic (pedicle) forceps. |
| 6. Retractors. | 20. Photographic apparatus and shutter. |
| 7. Sponges—ordinary size; elephant ear; small. | 21. Electric battery and lights. |
| 8. Sponge-holders. | 22. Forehead-mirror. |
| 9. Silk; catgut; iron and silver wire. | 23. Rubber pad. |
| 10. Drainage-tubes—rubber; glass. | 24. Aspirator. |
| 11. Horsehair for drainage. | 25. Esmarch's bandage: tourniquet. |
| 12. Sharp spoons. | 26. Iodoform-dredger. |
| 13. Volsella. | 27. Splints. |
| 14. Paquelin cautery. | |

Instruments for Operation on the Brain and Spine.

- | | |
|---|---|
| 1. Brain case of instruments. | 11. Keen's double brain-electrode. |
| 2. Rongeur forceps. | 12. Battery and electric light. |
| 3. Horsley's or other Rolandic fissure meter. | 13. Iodoform-gauze. |
| 4. Broca's calipers. | 14. Canula and hollow needle. |
| 5. Thermometer. | 15. Decalcified bone. |
| 6. Müller's fluid. | 16. Aniline pencil. |
| 7. Bottle for cerebro-spinal fluid. | 17. Rat-tooth forceps for dura. |
| 8. Bottles for specimens. | 18. Horsley's putty for hemorrhage from bone. |
| 9. Opium and ergot to be given beforehand. | 19. 1:2000 gauze. |
| 10. Faradaic battery. | 20. Plain sterilized gauze. |
| | 21. Skull and Cast of brain. |

Operations on the Mouth and Throat.

- | | |
|--|--|
| 1. Special case of instruments. | 9. Snare. |
| 2. Intubation-case. | 10. Tracheotomy tubes and tapes. |
| 3. Oral specula, gags, and retractors. | 11. Feathers. |
| 4. Stick sponges. | 12. Long curved forceps. |
| 5. Special needles. | 13. Harelip pins. |
| 6. Volsella for tonsils. | 14. Tracheal tube (Trendelenberg's or Hahn's). |
| 7. Tonsillotome. | 15. Trachea dilator |
| 8. Long forceps. | |

Instruments for Abdominal Operations.

- | | |
|---|---------------------------------------|
| 1. Count instruments and sponges before operating and again before closing abdomen. | 6. Tube for washing stomach. |
| 2. Trocars. | 7. Long hemostatic (pedicle) forceps. |
| 3. Ovarian trocar and tubing. | 8. Abdominal retractors. |
| 4. Pedicle silk. | 9. Koeberlé's serre-nœud and pins. |
| 5. Senn's bone plates and Abbe's catgut rings. | 10. Enterorrhaphy needles and silk. |
| | 11. Elastic tubing. |
| | 12. Intestinal clamps. |

Instruments for Operation on the Male Genito-urinary Organs.

- | | |
|--|---|
| 1. Catheters. | 16. Modeller's clay. |
| 2. Bougies and filiform bougies. | 17. Saucer. |
| 3. Sound. | 18. Cocaine. |
| 4. Urethratomes and dilators. | 19. Keen's special retractor for supra- |
| 5. Urethrameters. | pubic cystotomy. |
| 6. Metal or rubber syringe, to inject | 20. Forceps and écraseur for tumors. |
| air or fluid into bladder. | 21. Petersen's bags. |
| 7. Lithotrites. | 22. Solution for bladder. |
| 8. Litholapaxy set. | 23. Cystoscope and battery. |
| 9. Stone forceps and scoops. | 24. Abdominal electric light. |
| 10. Staffs (urethral and perineal). | 25. Dalley's steel nail. |
| 11. Crooked scissors. | 26. Catheter for ureter. |
| 12. Watsou's perineal drainage-tube | 27. Arrange for Trendelenberg's posi- |
| and rubber tubing. | tion. |
| 13. Long hemostatic (pedicle) forceps. | 28. Ureteral catheters. |
| 14. Snare. | 29. Perineum distender. |
| 15. Petticoated tube. | |

Instruments for Operation on the Female Genito-urinary Organs.

- | | |
|---------------------------------------|-------------------------------------|
| 1. Special case of instruments. | 13. Strong rubber cord. |
| 2. Specula. | 14. Trocars. |
| 3. Stick sponges. | 15. Long probe. |
| 4. Special needles. | 16. Crooked scissors. |
| 5. Perineum distender. | 17. Urethral dilators. |
| 6. Long hemostatic (pedicle) forceps. | 18. Petersen's bags. |
| 7. Hawk-bill or toothed scissors. | 19. Pedicle silk. |
| 8. Snare. | 20. Abbe's catgut rings for lateral |
| 9. Uterine sound, | anastomosis. |
| 10. Uterine clamp. | 21. Silk and needles for enteror- |
| 11. Uterine dilators. | rhaphy. |
| 12. Uterine curettes and forceps. | 22. Koeberlé's serre-nœud and pins. |

Operations on the Rectum.

- | | |
|------------------------|---------------------------|
| 1. Stick sponges. | 5. Forceps for piles. |
| 2. Rectal specula. | 6. Snare or écraseur. |
| 3. Perineum distender. | 7. Todd's rectal dilator. |
| 4. Rectal bougies. | |

Operations on Bones.

- | | |
|---------------------------------------|-----------------------------------|
| 1. Case of bone instruments. | 10. Flannel. |
| 2. Esmarch's bandage. | 11. Decalcified bone. |
| 3. Sharp spoons. | 12. Saud-bag. |
| 4. One-half inch trephine. | 13. Adams's saw. |
| 5. Surgical engine and drills. | 14. Macewen's osteotomes, chisel, |
| 6. Hand-drills and stout wire. | and mallet. |
| 7. Special splints. | 15. Mastoid perforator. |
| 8. Suspension apparatus. | |
| 9. Plaster-of-Paris and plaster baud- | |
| ages. | |

Special Instruments.

- | | |
|--|--|
| 1. Special case of instruments for each operation. | 10. Sand pillow for nephrorrhaphy or osteotomy. |
| 2. Iodoform in ether and syringe. | 11. Lithotomy forceps for nephro-lithotomy and cholecystotomy. |
| 3. Rubber adhesive plaster. | 12. Oesophageal bougies. |
| 4. Davies' lever or long skewer. | 13. Bellocq's canula. |
| 5. Bullet-forceps. | 14. Mastoid perforator. |
| 6. Nélaton's probe. | 15. Special splints. |
| 7. Tenotomes. | 16. Instruments for gall-bladder and gall-stones. |
| 8. Plaster of Paris bandages and plaster. | |
| 9. Morris's kidney-retractors. | |

I add a few words of explanation as before.

In my operating-satchel I always carry a small general operating-case with the instruments ordinarily required. I need not enumerate them, for each surgeon will follow his own desires and the necessities of his kind of work. I may mention, however, a few which I have found especially useful.

I almost always use the Hagedorn needles, an assortment of which I carry in a small bottle in carbolyzed glycerin. For these I have found by far the best needle-holder to be that of Abbe, of New York, with McBurney's spring catch on one blade of the handle. I have found the little "Tweed dropper" the most useful in etherization. It fits into any one of Squibb's ether cans, and thus avoids the necessity of carrying any ether bottle.

I have always found it an economy of space to have two of my scalpel handles tipped with Volkmann's sharp spoons. Another instrument I have, which is not generally known to the profession, is Dr. Allis's "dry

FIG. 2.



Allis's dry dissector. Half-size. The two blades are just thick enough to be strong.

dissector," for tearing tissues and separating muscles, loosening adhesions, scraping away the periosteum, etc. I find this one of the most useful instruments in my case. Instead of this I very often use two dissecting-forceps—one in each hand—one to seize and the other to tear the tissue, and have found them more useful by far than seizing the tissue with a pair of forceps and tearing with the grooved director or finger, though each of these means serves a good purpose at times.

I carry a few sponges in a glass-stoppered bottle in a carbolic solution, though I rarely use them now. In another bottle, in the same solution, I have some rubber drainage-tubes, silk, etc.; and in another smaller bottle, again in a carbolic solution, some disinfected horsehair for drain-

age. The horsehair is first washed well with soap and water, then with ether to dissolve the fatty matters, and then is disinfected in 1:1000 sublimate solution before being placed in the bottle. In addition to a nest of three large tin pans I carry a small rubber pan, such as photographers use, and place my needles, needle-holders, ligature-reel, and sutures in that.

INSTRUMENTS FOR OPERATION ON THE BRAIN AND SPINE.

(11) My double brain electrode is figured in *Wood's Reference Handbook*, vol. viii. page 212, but the disinfected metal ends of the ordinary battery cords answer very well.

(18) Horsley's putty for hemorrhage from the diploë is made as follows: Melt repeatedly one part of yellow wax and four of vaseline. Next add carbolic acid, one part to twenty of the wax and vaseline, and mix intimately. Then add sufficient white wax to make a mass that will be hard when cold, but that can be quickly softened by the fingers. With this (kept disinfected, of course) he "putties up" the vessels in the edge of the bone.

(19, 20) The 1:2000 gauze I always use to the head before head operations instead of the 1:1000, because I have found that the 1:1000 pustulates the scalp, which the weaker gauze does not do. Plain sterilized gauze I always provide for use as sponges as soon as the brain is exposed, as the antiseptic lessens or destroys the irritability of the brain to the Faradaic current.

(21) I always have a skull and a cast of the brain for reference during an operation.

INSTRUMENTS FOR OPERATIONS ON THE MALE GENITO-URINARY ORGANS.

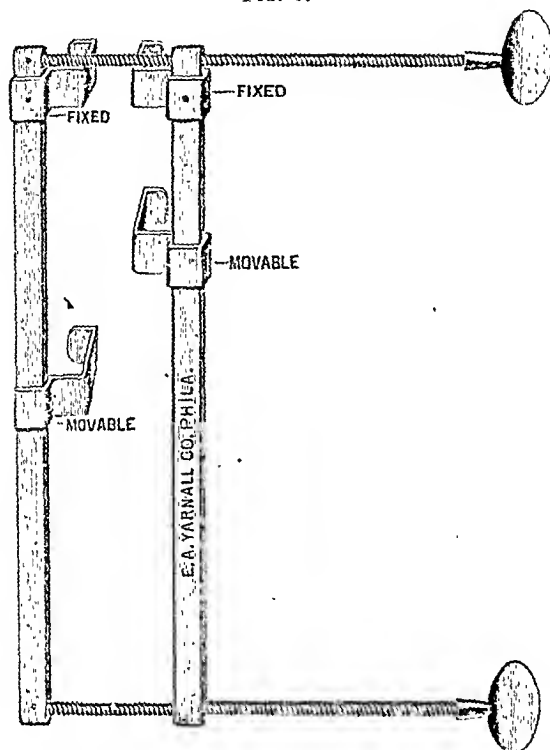
(19) My special retractor (see illustration on page 22) I have recently devised and used with great satisfaction in one case. The very day I had it made I saw in the *Lancet* of October 18, 1890, p. 809, an instrument of Dr. Watson, of Boston, for the same purpose. My own has, I think, the advantage that its force is better regulated than by a spring, and as two of the jaws are movable it may be used in the abdomen or elsewhere, and with varying sized openings.

Some instruments, etc., will be found duplicated in the lists, because I especially desire not to forget them.

Mr. Mayo Robson, of Leeds, has recently published a little volume of 52 pages, entitled *Instruments and Appliances Required in Operations* (London: Churchill, 1889). In this there is a list of instruments, dressings, appliances, etc., required in each operation. It will be found much more complete, of course, than my own. But I have found practically that a list covering the instruments required in each class of

operations, together with the general list and the list of special instruments to be quite sufficient for my purpose.

FIG. 3.



The author's retractor for supra-pubic cystotomy, abdominal sections, etc., when needed.

My own method also has one essential advantage. In using Robson's book the surgeon has to write out all his directions each time for the nurse, for drugs, etc. By my blanks the surgeon tears one off from the pad and has only to check what he wants done in parts I and II., and hand it to the nurse, and check what he wants in parts III. and IV. and send it to the drug-store after adding his signature, the name and address of the patient, and the date. It is a great economy in time and trouble. He then looks over the lists of instruments, etc., and selects what he wants.

THE MODERN TREATMENT OF SCIATICA.

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It has appeared to the writer not a little strange that the affection which forms the subject of this paper should have been so long a

term of reproach to the profession. The subject has great relative importance. The domain of sciatica is a broad one, for, although it is to a certain degree modified by climatic influences and hygienic environment, it is common to all countries. No distinctions of class are recognized, the prince and the pauper suffering alike, and the suffering in many instances is without a parallel in medicine. In not a few examples, the disease has produced a condition of physical disability which has rendered the patient absolutely helpless and a burden to society. Here are factors, one would think, sufficiently numerous and important to have led to such earnest and conscientious study of the subject as would have given scientifically accurate results in diagnosis and treatment long ago. It is only, however, within recent years that we have learned to differentiate sciatica from rheumatism and gout, and our knowledge of the pathology and consequent rational therapeutics of the disease is of much more recent date. The etiology of the affection has been, for many years, fairly well understood, a statement which is also true of the clinical history, though much new light has been thrown upon the latter phase of the subject by recent investigations of peripheral nerve diseases. This knowledge is the outcome of a study of the pathology involved, the only field in which investigations lead to accurately scientific results.

The birth of the literature of peripheral nervous diseases may be said to date from the beginning of the present decade, and to Leyden probably belongs, more than to any one else, the credit of first establishing the subject upon a scientific basis. Multiple neuritis as a distinct entity in medicine, owes its recognition by the profession to a description given by Leyden in a paper published in 1880. This was followed by a series of investigations, carried out by Pitres and Vaillard,¹ the results of which, as published from time to time, embody about all of practical importance which we know of the diseases of the peripheral nervous system. Much additional and valuable information has been gathered, also, through the investigations of Erb,² Remak, Babin-ski, Adamkiewicz, and others, and though the subject has not yet been entirely elucidated, we know much that was not even suspected ten years ago, and our knowledge is increasing daily. Although not directly the object of most of these investigations, sciatica has been found incidentally to exemplify many of the pathological conditions which have been observed. As a result we have (besides the overthrow of the delusion of identity of rheumatism and gout with the disease in question) two distinct conditions of disease, often clearly demonstrable clinically, instead of the one indefinite and poorly understood symptom-

¹ Pitres and Vaillard: *Gaz. Médecine de Paris*, 1887; *Revue de Méd.*, 1887.

² Erb: *Neurolog.-Centralblatt*, 1883.

group. In other words, we have to-day to deal with sciatic neuritis on the one hand, and sciatic neuralgia on the other. The importance of the distinction may be appreciated when it is stated that both prognosis and treatment depend upon its recognition. Incidentally, and as corollary to the above, it may be added that the reputation of the physician in attendance is also involved.

The establishment of the fact that true neuritis is the pathological condition in certain cases of sciatica, has led, as might have been expected, to the belief on the part of many, that it is the *only* condition ever present. With such it is believed that the essential factor is always of an inflammatory character, and that the difference in clinical symptoms depends only upon the degree of inflammatory action. While there is much to support this view, I am one of those who believe that there are cases which must be still classed as neuralgic, rather than neuritic. There are certainly two very distinct clinical types to be met with, and it is difficult to reconcile them to a common pathology. In order to illustrate the difference, according to the type present, I append the following symptom-groupings, which will also serve for purposes of differential diagnosis.

Sciatic Neuritis.

Causes: Wounds and tumors indicate neuritis rather than neuralgia.

Pain duller; occurring in paroxysms, and in intervals, paræsthesia of pricking, tingling and numbness.

Movements of limb, especially forcible extension, give pain.

Anæsthesia rapid in onset at times and in limited areas.

May be swelling along course of nerve and tenderness on pressure.

Trophic changes in skin, hair and nails. Trophic wasting of muscles.

Paresis or paralysis of muscles, with reaction of degeneration to galvanic current, may be present.

Faulty position of body (Babinski, Nicodoni) sometimes observed.

Sciatic Neuralgia.

Etiology same, except that constitutional states—as anæmia, malaria (?)—indicate neuralgia, unless bilateral.

Pain sharp and more constant. Paræsthesia rare, especially numbness.

Pain not specially aggravated by movements, if at all affected.

Actual anæsthesia very rare. General numbness may occur.

No swelling. Pain, not tenderness, on pressure at certain points.

No trophic changes. Slight wasting may occur from disuse.

No paresis or paralysis. No reaction of degeneration.

Faulty position quite exceptionally met with.

As with every other disease, classical types in sciatica are the exception, but sufficient data may be secured in nearly all cases to enable you to reach an approximately correct diagnosis as to the special form you may have to deal with. A loss of tactile perception is always strongly suggestive of neuritis, while paresis or paralysis, with the reaction of degeneration to the galvanic current in the affected nerve, is positive evidence of a nerve degeneration. The pathological conditions found

are sufficient to account readily for the symptoms, and the variations in intensity of the same. The neuritis, if the case is such, may be either parenchymatous or interstitial.¹ The perineurium may be alone affected, or the nerve-fibres may be pathologically altered from inflammation or pressure. The usual process is that of ordinary inflammation following some such excitant as trauma or cold, giving rise to vascular engorgement, with the outpouring of leucocytes and a succeeding proliferation of interstitial tissue. These morbid products fill up the nerve-sheath and by pressure destroy the sheath of Schwann, set up a degenerative process in the axis-cylinders, finally producing a sclerotic condition of the nerve-fibres or completely destroying them. The intensity and extent of the symptoms will, of course, depend upon the extent and activity of the inflammatory action. Such is the pathology of sciatic neuritis. In a certain number of cases, however, no such conditions are found, and, indeed, section and examination of the nerve reveals nothing, either macroscopically or microscopically, which will account for the symptoms. We are compelled, while acknowledging that future investigations may show that such cases belong to the type described above, to class them differently for the present, and I know no better term for the condition than neuralgia. While an acceptance of the term involves a begging of the question from a pathological standpoint, we are not yet in a position to dispense with it. Except that it is supposed to involve a state of nerve irritability, dependent upon trophic influences or altered nutrition, etc., neuralgia may be said to be without a pathology.

I shall not consider the clinical history or differential diagnosis of the disease any further, assuming the existence of a general familiarity with both divisions of the subject. With regard to the identification for many years of sciatica with rheumatism and rheumatic states, I find it difficult to understand how such an association came to be so generally accepted.² The clinical symptoms differ widely, and in an experience with more than sixty cases, treated during the past three years at the Department of Nervous Diseases of Prof. Landon Carter Gray in the New York Polyclinic, I have found the so-called "anti-rheumatic" remedies exceptionally curative in sciatica.

The modern treatment of sciatica, based upon an enlightened pathology, represents a revolution in therapeutics, and varies radically with the type present. While many of the drugs and measures in use in former years are still indicated in the neuralgic type, the pharmacopœia

¹ Starr: Middleton-Goldsmith Lectures. Med. News, 1887. Erb: Ibid. G. Hammond: Journal Nervous and Mental Diseases, May, 1890.

² Pitres and Vaillard found nerve degeneration following rheumatic deposits as a cause, but the cure of the rheumatism in such cases does not cure the neuritis: *Revue de Méd.*, 1887. See also Duplaix: *Gazette des Hop.*, 1887.

of sciatic neuritis is an entirely new one. A summary of the most reliable of the modern anti-neuralgic and analgesic remedies will include phenacetine, antipyrine, antifebrin or exalgine, cocaine and osmic acid, the last two used hypodermically alone. Of these, phenacetine is by far the most reliable and satisfactory. Doses of seven and a half grains, given at four- or six-hour intervals, I have found quite effective, though larger quantities may be given with perfect safety, if necessary. Exalgine I have found, after repeated tests, very unreliable. With osmic acid, recommended in America by S. Solis-Cohen, in ten-minim doses of a one per cent. solution hypodermically, I have had little experience. It is, of course, advisable to antagonize by proper medication any cachexia which may be present, and tonics, including change of air, will be found of value in all neuralgic states. A combination of iron, quinine, and arsenic, is a common formula, and answers quite well.

It is in the treatment of neuritis of the sciatic nerve that we have to note the most radical innovations in therapeutics, and the greatest advancement in results. It is of primary and essential importance in these cases to look for and, if possible, remove the cause. This may be either mechanical and local, or constitutional. Among the local causes may be mentioned, in addition to wounds, strains and hip-joint disease, tumors of the pelvis, fecal accumulations, uterine displacements, varicose veins and aneurisms. Exposure to cold may also be cited as a local excitant, though it probably acts in a double capacity. Toxic conditions of the blood give rise to a local neuritis occasionally. Lead and arsenic among the metals, diabetic states, alcoholism, syphilis, and certain microörganisms, as in malaria, have been cited as causes. Bury, in an article published in 1888 in the *Manchester Medical Chronicle*, called attention to the frequent development of neuritis in association with tubercular phthisis and typhoid fever. 'Thrombic occlusion of a local bloodvessel may be the explanation in some of these cases.' Removal of the cause, where the relationship is clear, is at times all that is necessary in the line of treatment. If this is not determinable, the treatment resolves itself into three cardinal principles—the relief of pain, the antagonizing of inflammation, and absolute rest of the part. Of these three, the last is most important. The patient should not only be put to bed and kept there, but he should be mechanically restrained from exercising the functions of the diseased nerve. This can be best accomplished by applying a splint,² preferably a long hip-splint, extend-

¹ Pitres and Vaillard conducted a series of experiments with hypodermic injections of ether and other agents along the course of the sciatic and other nerves, producing thereby a rapidly developing form of neuritis. The possibility of such a result should always be considered in using any irritant drug in the neighborhood of nerve trunks by hypodermic injection: *Gazette Méd. de Paris*, 1887.

² S. Weir Mitchell, M.D.

ing from the axilla to the foot, so adjusted to the side of the body and leg as not to interfere with local treatment along the course of the nerve. The splint should be worn until the symptoms have disappeared or until the disease has passed into a chronic state, which is rare to-day in comparison with its former frequency. Inflammation is best antagonized by cold applications in the form of rubber bags filled with ice. In the few cases in which cold acts badly, hot applications may be substituted. They should never be alternated, however. This treatment, with morphine to relieve pain, is all that is necessary in the first stages. After the acute stage has passed, the cold applications may be dispensed with. Your active inflammation has subsided, and you have to deal with the mechanical effects produced by the morbid products of inflammation within the nerve-sheath. To hasten the absorption of this irritating material massage will be found most valuable. The manipulations should be gentle at first, once or twice daily, and continued from fifteen to thirty minutes. It is here that electricity finds its place by reason of its catalytic and alterative action. Galvanism is the form indicated, and the entire nerve should be included in the action of the current, which should be continuous, never interrupted. The *séances* should be short at first, and the quantity used should not exceed five milliamperes or less. Should the case manifest any tendency to develop a chronic state, the current should be increased, or it may be interrupted slowly, for its stimulating effect. The interrupted current should, however, be used in these cases with extreme caution.

I have found little benefit from so-called specifics in this form of sciatica. Turpentine, nitrate of silver, sulphur, cocaine, etc., have been monotonously disappointing. Iodide of potash, while theoretically indicated, has proven of little value in my experience except in one case in which there was a distinct specific history and cachexia. In this particular case, the recovery of the patient I attributed as much to the inunctions of mercury used as to the iodide.

Counter-irritants, while markedly beneficial in a small proportion of cases, are not at all certain. Nerve-stretching I believe to be absolutely valueless and a dangerous procedure, while in two instances in which section of the nerve has been done, in one the relief was only partial, the other not being benefited at all, while in both cases a semi-parietic condition remained more or less permanently.

NOTES ON SIX CASES OF PERINEAL SECTION; WITH SOME REMARKS ON THE TECHNIQUE OF THE OPERATION.¹

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THERE has always been more or less confusion in the nomenclature of the perineal operations for the relief of stricture. The old *boutonnrière* operation (of which the so-called "Cock's operation" is a modification) had for its object the opening of the urethra behind the obstruction, was purely palliative, and if it ever effected a cure did so by accident, as the procedure itself did not include of necessity any division or enlargement of the strictured portion of the canal. It is an "external urethrotomy," to be sure, but it is not related either in its purpose or its method to the other operations known by that name.

Since Syme revived and popularized the formal operation of external urethrotomy—the division of a stricture upon a grooved staff passed through it into the bladder—more system has been introduced into the terms employed, but there is still much objectionable looseness. Hunter, Grainger, C. Bell, and others had, before Syme's time, formulated the operation known as "perineal section," which was also an external urethrotomy, but which was then restricted to those cases in which no instrument whatever could be made to pass the stricture. The term should still be reserved for such cases, and on account of its brevity is, perhaps, preferable to its synonym, "external perineal urethrotomy without a guide."

The cases which follow belong exclusively in this category—*i. e.*, are all cases of perineal section, and do not include any cases of external perineal urethrotomy. They were all performed during acute retention of urine, which resulted in two from recent complete rupture of the urethra; in two from traumatic stricture following old and presumably incomplete rupture; in one from very old neglected strictures and recent false passage; in one from stricture and false passages, both of many years' duration. Such cases are so frequent in the practice of every hospital surgeon that I shall summarize them as briefly as possible, my object in reporting them being chiefly to call attention to certain details of the operation, and to invite discussion upon them.

CASE I.—E. C., æt. forty-four. Cause and duration of obstruction: five attacks of gonorrhœa twenty years ago. Urinary symptoms for fifteen years.

Condition when first seen: Urinating in drops every fifteen or twenty minutes, with tenesmus. Bladder distended; free bleeding from recent

¹ Read before the American Association of Genito-urinary Surgeons, 1890.

attempt at catheterization. False passage, beginning just anterior to the triangular ligament and running between prostate and rectum. No instrument could be passed.

Date of operation: October 30, 1889.

Details of operation: False passage filled with filiform bougies. Syme's staff passed down to membranous urethra. Perincum opened on point of staff. Urethral walls held asunder by silk threads. Clots turned out from false passage. Firm fibrous stricture, easily recognized. No probe would pass through it. Urethra posterior to it, dilated to the size of the thumb, was opened and flat grooved director was passed into the bladder. The stricture was freely divided; a large sized Nélaton catheter was passed through whole length of urethra into bladder and left *in situ*. An attempt at suturing the urethra failed, on account of lack of material at seat of stricture. Wound packed with iodoform gauze. No serious difficulty met with.

Time of operation: Thirty-five minutes.

Subsequent course of case: Uninterrupted recovery. Catheter removed in six days. Regular catheterization every four hours begun on the fifteenth day. Wound healed entirely on the thirty-seventh day.

Calibre of urethra at date of discharge: Patient passes No. 31 French sound easily.

CASE II.—W. K., æt. fifty-five. Cause and duration of obstruction: Gonorrhœa in 1862 and 1863. Urgent urinary symptoms for six months.

Condition when first seen: Absolute retention. Bladder up to umbilicus; perineum and scrotum distended with urine, brawny and discolored. Moderate degree of shock. No instrument could be passed.

Date of operation: November 17, 1889.

Details of operation: Syme's staff introduced and cut down upon. Perineum filled with old plastic lymph, partially organized and of almost cartilaginous density. Urethra almost obliterated for three-quarters of an inch posterior to the bulb. Field of operation obscured by extremely free oozing from dilated vessels, which, imbedded in the lymph, seemed to be kept patulous. Urethra finally found near apex of prostate; flat director passed into bladder.

Tissues in course of urethra which could not be recognized as a distinct canal between the bulb and the prostate were freely divided; Nélaton catheter No. 26 French was passed and tied in.

No attempt at suture was made. Wound packed with iodoform-gauze.

Time of operation: Seventy minutes.

Subsequent course of case: Tedious convalescence, on account of condition of perineal tissues. Catheter removed in fourteen days. Catheterization begun in twenty-four days. Wound closed on forty-eighth day.

Calibre of urethra at date of discharge: Patient passes 32 French easily.

CASE III.—J. B., æt. thirteen. Cause and duration of obstruction: Rupture of urethra from fall astride the sharp edge of an upturned empty barrel nine years previous.

Condition when first seen: Very frequent urination. Only partial evacuation of bladder. Some straining. Urine loaded with pus; a

WHITE, PERINEAL SECTION.

few granular and hyaline casts. Patient pallid and emaciated. No instrument could be passed.

Details of operation: Urethra opened on Syme's staff. A long and tedious dissection failed to disclose opening of stricture. Canal opened at base of prostate. Intervening tissues divided. Nélaton No. 15 French left in bladder. Wound packed. No suture.

Time of operation: ninety minutes.

Subsequent course of case: On the seventh day had orchitis of right side; at end of second week had rigor, followed by fever. Subsequently had frequent attacks of pyrexia, with exceedingly high alternating with subnormal temperatures. Urine loaded with pus. Pain over left kidney. No relief from any form of treatment. Diagnosis: Pycclitis. Exploratory nephrotomy recommended, but refused by parents. Patient passed from notice with small perineal fistula still discharging.

Calibre of urethra at date of discharge: No. 15 French passed easily.

CASE IV.—L. N., æt. forty. Cause and duration of obstruction: Fell astride of an iron girder twenty-four hours previous.

Condition when first seen: Absolute retention; great distention of bladder; free bleeding from meatus; perineum and scrotum swollen and infiltrated. No instrument could be passed.

Details of operation: Median section of perineum. Large quantities of blood and urine escaped. Scrotum incised with same result. Catheter passed through meatus protrudes into wound, and a complete rupture of the urethra is found extending through the so-called bulbous portion—the posterior part of the spongy portion.

A long search for the posterior portion failed to find it, until by pressure upon the pubes a jet of urine was made to appear in the wound, and led to the discovery of the proximal end twisted upon itself, retracted, and resembling the end of a large artery which had undergone torsion. A director was first passed through it into the bladder. Then an English gum catheter was passed for the whole length of the urethra. It was found, by moderate traction, that the two ends could be brought into contact. They were then united by six interrupted sutures of very fine chromicized gut, which resists absorption for two or three weeks. The sutures were passed through the entire thickness of the urethra. A large rubber drainage-tube was then laid in the wound, the inner end of the tube opposite the point of junction. The angles of the perineal wound were then united by deep silver sutures, and the centre gently packed around the drainage-tube.

Time of operation: One hundred and twenty minutes.

Subsequent course of case: No fever; no pain. Urine possibly appeared through perineal wound for three days, but in such small quantity that it was uncertain. None later than that. Catheter removed on ninth day, but passed gently every four hours. Drainage-tube removed on twelfth day. Perineal wound healed solid on twentieth day. Patient urinated in a full stream at this time. Went home on twenty-fifth day.

Calibre of urethra at date of discharge: Passing No. 30 steel sound easily and painlessly for himself.

CASE V.—J. W., aged seventeen. Cause and duration of obstruction: Climbing from the roof of an out-house fell astride a fence thirty-six hours previously.

Condition when first seen: Retention. Urethrorrhagia. Bladder abnormal. Perineum distended. No instrument could be passed.

Details of operation: Median incision. Complete rupture of membranous urethra; posterior portion of urethra promptly found by bimanual pressure, one hand on the hypogastrium with fingers of the other in the rectum. A portion of bruised proximal end cut off with scissors to obtain good material for sutures; five chromicized gut sutures passed so as to unite urethra over an English gum catheter No. 20. Drainage-tube laid in wound, which was united at angles and packed in centre with iodoform-gauze.

Time of operation: Forty minutes.

Subsequent course of case: No fever. No pain. No appearance of urine in wound. Catheter removed on the fifth day on account of vesical irritation. The next day a few drops of urine came through the perineal wound. Catheter was used every four hours. No further leakage occurred. Drainage-tube was removed on ninth day. Wound healed solidly in two weeks, patient urinating freely and painlessly on the seventeenth day. Went home in three weeks.

Calibre of urethra at date of discharge: Passing No. 22 steel sound easily.

CASE VI.—P. M., aged thirty-three. Cause and duration of obstruction: August, 1889, fell into a trench fourteen feet deep, alighting astride a plank. Had symptoms of incomplete rupture of the urethra. Retention relieved by catheterization. In October retention again and formation of extensive false passage during attempted catheterization.

Condition when first seen: Retention. Passing large quantities of blood from the meatus in the form of clots. Bladder much distended. Shocked. No instrument could be passed.

Details of operation: Median incision on Syme's staff passed down to obstruction. Enormous quantity of clot turned out of perineum. Bimanual pressure caused the protrusion of a clot from a portion of the urethra back of the seat of the original injury, which was near the prostatomembranous juncture. The stricture was divided on the floor of the urethra, a large catheter passed and then the tissues brought together by a continuous catgut suture uniting the edges of the incision, which was parallel to the long axis of the urethra. Drainage-tube and packing as in the other cases.

Time of operation: Sixty-five minutes.

Subsequent course of case: No fever. No pain. Urine came through wound for five days. Catheter withdrawn in ten days. Bladder emptied by Nélaton catheter every four hours for four days. Drainage-tube withdrawn on the fifteenth day. Wound healed solidly on the seventeenth day, patient urinating naturally in three weeks. Went home on the twenty-seventh day.

Calibre of urethra at date of discharge: Uses No. 31 steel sound easily.

In cases of extravasation of urine following rupture it has been thought that some light could be thrown by the history of the accident upon the probable situation of the injury.

Franc, Velpeau, and Poncet have attributed the urethral laceration to the crushing of the membranous portion of the urethra between the

offending body and the lower border of the pubic arch. If the accident occurred with the patient in a leaning position, the body directed forward, they believe that the posterior part of the spongy urethra could be crushed against the pubis; and think that when the force that produces the injury acts in the lateral direction the urethra is more probably pressed against the upper portion of the descending pubic ramus. Ollier refers lacerations of the membranous urethra to the pressure of the canal against the sharp edges of the subpubic ligament, which in his experiments seemed to have divided the upper wall of the urethra. Terrillon believes that when the body which is fallen upon is narrow the urethra is crushed against the ramus of the pubes, and thinks the injury is likely to be found about the region of the bulb; and when the fall is upon a broader substance, the urethra is crushed against the anterior surface or inferior edge of the pubes and the lesion is found more anteriorly. Guyon says that in this accident, whether the cause is a fall or blow, the mechanism is the same; the urethra and the soft parts which immediately surround it are pressed and crushed against the resisting pubic symphysis, whilst the superficial tissues, more supple and more elastic, escape or are scarcely involved. He believes, as does Terrillon, that such ruptures are frequently only partial, and that they are commonly situated in the spongy part of the urethra, an inch or less in front of the anterior layer of the triangular ligament, and in this opinion he is supported by Iversen, who has recently analyzed twenty-nine cases of this accident. Duplay thinks that in a certain proportion of cases the urethra is ruptured by a temporary dislocation of the symphysis pubis, the soft bones springing back into their proper relation after the crushing force is removed, and leaving no trace of the accident except the urethral lesion.

He thinks that this "rupture by traction" may also occur in a case of fracture of the pelvis with a displacement of a portion of the pubic arch; and it is of course evident that the urethral wall could be wounded directly by a fragment of bone after such a fracture.

In my own experience the history of the case has been of but little value in determining the seat of laceration, which could be better estimated by the character and limitation of the extravasation.

The urethra may, for example, be divided into four regions. In all that part from the meatus to the scrotal curve extravasation is accompanied by a swelling and discoloration of the penis, greatest in the immediate neighborhood of the injury.

In the region included between the attachment of the scrotum and the anterior part of the bulb, the course of extravasated blood or urine is governed by the attachments of the deep layer of the superficial fascia, or fascia of Colles.

Extravasation of urine occurring through laceration in the bulbous

region of the urethra will first follow the space enclosed by this fascia in front and below, and by the anterior layer of the triangular ligament posteriorly, and, as it cannot reach the ischio-rectal space on account of the attachment of the fascia to the base of the ligament, and cannot reach the thighs on account of the insertion of the fascia into the ischio-pubic line, it is directed into the scrotal tissues, and thence up between the pubic spine and symphysis until it reaches the abdomen.

If the injury affect the membranous urethra alone, the surrounding structures not being involved in the laceration, the extravasated urine would be confined to the region included between the layers of the triangular ligament, and would only gain access to other parts after suppuration and sloughing had given it an outlet. The consecutive symptoms would then depend upon the portion of the aponeurotic wall which first gave way.

If the injury is situated behind the posterior layer of the triangular ligament, *i. e.*, in the prostatic urethra, the urine may either follow the course of the rectum, making its appearance in the anal perineum, or, as it is only separated from the pelvis by the thin pelvic fascia, it may make its way through the latter near the pubo-prostatic ligament, where it is especially weak, and may spread rapidly through the subperitoneal connective tissue.

According to Iversen, the external swelling is usually absent, and the above occurrences are to be suspected from the severity of the symptoms.

In the presence of retention of urine from recent rupture of the urethra in which catheterism is impossible, there can be no doubt as to the proper procedure. Immediate perineal section is so obviously the only operation which meets all the indications that no other can be seriously considered.

In mild cases of rupture, *i. e.*, in those where after such an injury there is an appearance of blood at the meatus, with difficult urination, or with retention, but with no evidence of extravasation, or no general alarming symptoms, and in which catheterization is easy, the surgeon may be content with regular evacuation of the bladder by means of a soft instrument, well greased with carbolized oil, and with prescribing absolute rest, the patient being carefully watched for the onset of fever or the appearance of local swelling. In cases of a more severe type, in which, in addition to urethrorrhagia and retention of urine, there are evidences of extravasation, and in which catheterism, though difficult, is possible, it is wisest to leave a full-sized catheter in the bladder, and at the same time freely to lay open the perineum and scrotal tissues, or any which have been involved in the extravasation.

In the cases of greater gravity, however, where no instrument can be passed into the bladder, perineal section is, as I have said, imperatively

indicated. The steps of the procedure are obvious and beyond dispute except as to a few points; which I may mention *seriatim*:

1. If persevering search fails to reveal the proximal end of the torn urethra, are suprapubic cystotomy and retrograde catheterization justifiable? I am inclined to answer this affirmatively, though such failure should be most exceptional. If the bladder contains urine, and particularly if it is distended, pressure at the hypogastrium or bimanual pressure with the fingers of one hand on the abdomen and of the other in the rectum as recommended by Dr. Bangs will often cause a jet of urine to issue from the proximal end, and will at once disclose its situation. Hæmorrhage in the whole wound by very hot water will sometimes reveal the urethra by emphasizing the difference between its color and that of the surrounding parts, the urethra generally showing much paler. The relation to the pubis and to the lower edge of the triangular ligament should be most carefully borne in mind, the search for the torn end in ruptures and for the portion behind the stricture in these cases being frequently carried too near the pubes. The membranous urethra in the adult usually runs through the ligament about one inch below the symphysis and about three-quarters of an inch above the perineal centre. All guides, however, fail occasionally in certain of these cases, and it is then that supra-pubic cystotomy is warranted as an operation with so small a mortality that the slight additional risk is far outweighed by the advantage to the patient of having even an imperfect restoration of his urethral canal.

Retrograde catheterization was practised for the first time in 1757, by Verguin, a surgeon of Toulouse, who passed a catheter into the urethra through a pre-existent fistula of the bladder consecutive to supra-pubic puncture. Since which time a number of surgeons have had recourse to this procedure, and Sédillot formerly expressed the opinion, "that in the absence of a pre-existent fistula, if, in the course of an external urethrotomy, undertaken for an impassable stricture, it were found impossible to discover the posterior end, the surgeon would be justified in doing a supra-pubic cystotomy at once, in order to practise retrograde catheterization."¹

2. Although some differences of opinion exist as to the value of a retained catheter after most perineal operations opening the urinary tract, there can be no question of its value in cases of rupture, and I believe that it is of great use in *all* forms of perineal operation opening any portion of the urinary tract. If Spence's caution is observed, and it is not allowed to project too far into the bladder, if it is kept clean and sweet by regular antiseptic injections, it is of the utmost advantage in aiding in the

¹ Duplay: "Injuries and Diseases of the Urethra," International Encyclopædia of Surgery.

prevention of urethral fever, as has been shown by Keyes, Harrison, Diday, Shield, Hill, and many others.

3. After the introduction of the catheter in cases of rupture, is there definite advantage to be derived from urethral sutures?

The surgeon has four plans open to him: *a*, To leave the wound open without any attempt at coaptation; *b*, to suture the urethra only; *c*, to suture only the perineum; *d*, to suture the urethra at one place and the perineum at another.

The experiences of Guyon, Championnière, Le Dentu, Molière (de Lyon), Erasme, Kaufmann, of Zurich, Tenier, C. H. Mastin, Marmaduke Shield, and myself would seem to justify the employment of sutures of the urethra. By the introduction and retention of a large catheter, and the careful coaptation of the torn ends, we meet all the indications, which are:

1st. To open a large passage for the accumulating fluids; 2d, to keep up a free flow of urine; 3d, to encourage rapid union of the two ends of the urethra and the walls of the cavity formed by the extravasation into the perineum; 4th, to prevent the formation of a cicatricial stricture of the urethra.

My results by these methods have thus far been so extremely satisfactory that I shall certainly continue their employment.

4. The sterilization of the urine by boric acid, as recommended by Palmer and others, or by salol following the method of Dreyfous and Lane, is of great importance in the after-treatment of all these cases, and should never be omitted. These remedies will be more effective in my judgment if combined with full doses of quinine.

In all cases in which perineal section is performed for impassable stricture, without other complications, the method of Mr. Wheelhouse, of Leeds, seems to me to meet every indication. The passage of the staff to the stricture shows the exact site of the latter; the insertion of the threads into the divided urethra, serves not only to hold it open and give an opportunity for the discovery of the proximal portion, but also seems to fix the anterior end, and render it easily recognizable during the operation. The least useful direction which Mr. Wheelhouse gives is that of turning the staff with the concavity of the curve upward, so as to hook it into the upper portion of the urethral wound. The instrument is sometimes in the way, has to be held by an assistant, and it seems to me does not afford much help during the operation.

COMPLETE SCLEROSIS OF GOLL'S COLUMNS AND CHRONIC
SPINAL LEPTOMENINGITIS, WITH DEGENERATIVE
CHANGES IN THE FIBRES OF THE ANTERIOR
AND POSTERIOR ROOTS.

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THE function of Goll's column, or, anatomically speaking, the posterior median column of the spinal cord, has long been a subject of inquiry by physiologists and pathologists. Schiff divided the posterior median column in animals, and the inference which he drew from his experiments was that the fibres of this portion of the cord conduct tactile sensations. The difficulties of dividing this column without injury of fibres belonging to other systems, are insuperable. With the exception of the experiments of Rossolymno upon guinea-pigs, experiments upon animals such as monkeys, dogs, and cats all tend to confirm the inference derived from pathological observations made upon cases of injury of the posterior roots, such as lesions of the cauda equina. There can, therefore, be no doubt that the fibres of Goll's column are formed from processes of the cells of the spinal ganglia which pass in by the posterior roots, run through the postero-external columns, and eventually enter the median column of the same side. It is probable that these fibres become smaller as they ascend, for if we take a definite area of Goll's column, the fibres of which were derived from the lumbar and sacral roots,¹ say in the upper dorsal region, and count the number of fibres in this area by projection of a photo-micrograph upon the screen, it will be found that a greater number of fibres will exist in the upper cervical region than in the dorsal. This, of course, will account for the area of degeneration becoming smaller, the higher the level of the section. The fibres of Goll's column end above in the post-pyramidal nucleus.

The cells of this nucleus send fibres to the cerebellum, consequently impulses travelling up the fibres of Goll's column eventually reach the cerebellum. *A priori*, we should expect that Goll's column does not transmit sensory impulses unless they be those relating to the muscular sense. Cases which have been published, and which I shall refer to later on in detail, together with the present case which I here record, in which there was a sclerosis causing total destruction of almost the whole of the fibres of Goll's column, show that this column certainly does not conduct

¹ This can be ascertained by comparison with limited areas of degeneration made experimentally.

any centripetal impulses connected with the sense of touch, heat and cold, or pain. In these cases there have been symptoms which would point to a loss of the muscular sense, but the question arises whether these symptoms could not have been explained by the affection of the roots within the spinal canal, or the peripheral nerves. That the impulses should eventually reach the middle lobe of the cerebellum tends to show that this column may be connected with the muscular sense ; moreover, the fact that in locomotor ataxy it is generally the seat of extensive degenerative changes in company with the postero-external column, also lends support to this view.¹

Dr. Tooth considers that the posterior median column (consisting as it does of small fibres) conveys impulses from the viscera. I think cases of sclerosis of Goll's column do not support this view, although, anatomically speaking, it seems a plausible hypothesis ; but, as I have before suggested, the fine nature of the fibres may be due to their long course. I have endeavored to show the importance of this subject from a physiological point of view by these introductory remarks. I will now pass on to a description of the case.

M. G., aged forty-six years, fly-master, was admitted into Charing Cross Hospital under the care of the late Dr. Pollock, March 25, 1884, and I am indebted to Dr. Murray for having given me the spinal cord and notes of this case.

There was nothing in the family history of the patient which would have any bearing upon the case, and no hereditary predisposition to disease was indicated. There was no history pointing to syphilis, rheumatism, or tuberculosis, and for more than thirty years he had been free from illness. His occupation, however, exposed him to cold and wet daily, and he has frequently been wet through. Moreover, previous to his illness he had drunk heavily, taking as much as four pints of beer and several "goes" of spirits daily.

Present illness commenced early in 1882, with failure of power in the legs, the attack coming on while the patient was at his work in the morning. Two hours after the onset he was unable to walk. He suffered a great deal of pain, the legs becoming flexed and rigid. The loss of power gradually increased. About May, 1882, he noticed that the legs were wasting, and after September he was unable to walk even with support. A month or six weeks after the commencement of his illness, he noticed twitching of the hands, accompanied with weakness ; and the arms began to waste, but he did not completely lose the use of them. His condition gradually became worse, and he was an inmate of several hospitals before admission to Charing Cross.

Present state: Patient is fairly well nourished. Temperature 99° to 100°. Skin cool and moist ; no rash, cedema, or redness ; complains of no pain.

Upper extremities, including muscular attachment to scapula and clavicle, are thin and uniformly wasted. There is no rigidity except in the phalangeal joints, which can hardly be moved at all, voluntarily or

¹ Secondary Degeneration of the Spinal Cord, p. 71.

passively. Other movements are weaker than normal, but no movements except those of the second and phalangeal joints absolutely lost. The weakness and wasting are more marked on the left than on the right side, and, perhaps, the thumb and first dorsal interosseous are more affected than other muscles. The grasp is performed by means of flexion of the metacarpal phalanges upon the metacarpal bones. He can just hold a spoon or knife with his right hand. With his left hand he cannot hold either. Frequent fibrillary movements seen. Sensations of tactile and painful impressions normal, also of heat and cold. Absence of elbow- and wrist-jerks.

Lower extremities: Hips and knee-joints are kept perpetually in a position of semi-flexion, the ankles extended. Patient can flex hips and knee-joints fully, but cannot straighten them beyond an angle of one hundred degrees. There is slight power of movement of the ankle-joints and left great-toe joint, all other movements of the joints in the feet absent. Wasting of the lower extremities, especially below the knees, more marked even than in the upper extremities. It seems to be uniform, and not to affect any particular group of muscles. The tendo-Achillis on both sides is rigid. No ankle-clonus, and on the left side no trace of knee-jerk obtained, but on the right a slight flicker can be observed. Tickling the soles is painful, and causes movement of knee- and hip-joints, especially of the latter.

Abdominal and epigastric reflexes absent on both sides, cremasteric obtained. No difficulty in micturition or defecation. Complete loss of sexual power and desire for the last two years. Patient has never noticed any difference in hearing, smelling, or tasting.

Vision: Movements of eyeballs and field of vision normal. Contraction of pupils to light and accommodation natural. No nystagmus.

Facial movements, movements of tongue, speaking, mastication, and swallowing performed naturally.

All muscles react to faradic current, but a considerably stronger current than normal required to produce contraction. Irritability to galvanism is distinctly diminished.¹ K. C. C. greater than A. C. C.

Chest is of fair shape, no cough or expectoration. Movements not good, unsymmetrical. There was evidence of consolidation over the right apex, there being weak but harsh breathing, defective resonance, and bronchophony.

Heart-sounds weak, no valvular disease, cardiac dulness not made out.

Digestive system: Tongue clean, no sickness. Bowels regular.

Spleen: Physical signs normal.

Liver: Somewhat enlarged.

Urine: No albumin, acid, sp. gr. 1020.

A weak faradic current was ordered to be applied every morning for about ten minutes, and a tonic was prescribed.

April 4. Chest symptoms became much worse, evidences of excavation of the right apex. Temperature 101°, considerable capillary bronchitis, weak action of the heart. Chest was ordered to be rubbed night and morning with lin. tebrinth. acet. Sp. ætheris and mist. cinch. co. prescribed. The lung disease progressed rapidly, and on April 14th the temperature rose to 104°. April 15th the patient died.

Autopsy showed general tuberculosis, with formation of cavities in both

¹ At this time a galvanometer was not in use at the hospital.

lungs, congestion and œdema of the mucous membrane of the bronchial tubes, and a thickened pleura adherent in many places. There was an old cicatrix at the apex of the left lung, showing that the disease had been of considerable standing.

Heart: Valves healthy, degeneration of the muscular tissue.

Liver: Enlarged and fatty.

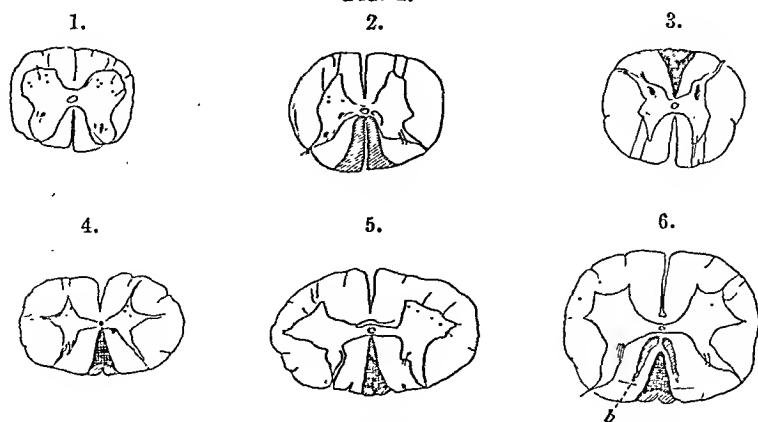
Kidneys: Normal, also spleen.

No note is made of the naked-eye appearance of the spinal cord, but when handed to me the dura mater appeared of normal thickness, and to the naked eye beyond the obvious sclerosis of Goll's column there was nothing very evident. I may state that I did not see the case, but after examination of the spinal cord I found it to be of unusual interest, and asked Dr. Murray to let me have the notes, which he was kind enough to give me.

The microscopical examination of the spinal cord, the roots, and ganglia, was made with the following results:

The naked-eye appearance of sclerosis of Goll's column did not become evident till the first lumbar segment, in this respect corresponding to other cases published. The appearances of the degeneration are shown in Fig. 1.

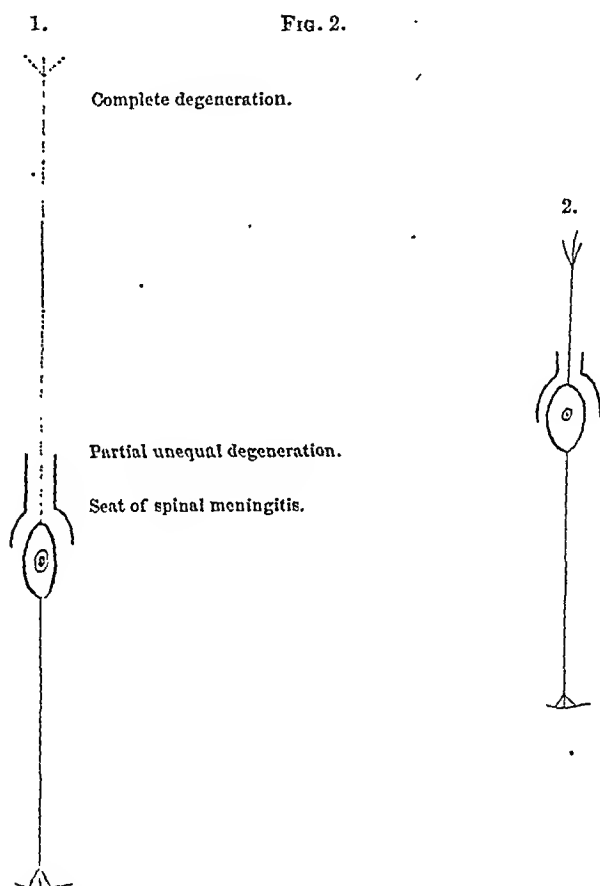
FIG. 1.



Sclerosis of Goll's column. 1. Lower lumbar, free from degeneration. 2. Scattered degeneration in posterior columns, indicated by light shading. Twelfth dorsal. 3. Dark shading, absolute degeneration of the greater part of Goll's column at level of eighth dorsal. 4. Second dorsal. 5. Eighth cervical. 6. Fourth cervical. Light shading partly degenerated fibres.

Careful microscopical examinations of the sections at different levels showed a chronic leptomeningitis, causing very considerable thickening of the pia mater with encroachment of the inflamed tissue upon the periphery of the cord. In this chronically-inflamed membrane were observed nerve-roots, the fibres of which were in various stages of degeneration, as shown in the accompanying Fig. 2. The number of

degenerative fibres found in different bundles varied considerably. Many bundles showed absolutely no degenerative changes. The anterior cornual cells, even where there was considerable degeneration of the anterior roots, showed no marked changes, consequently, the fibres were damaged after they had left the cord. Examination of the spinal ganglia showed no obvious changes in the cells or fibres in connection therewith. Inasmuch as Goll's column was sclerosed throughout, it must be

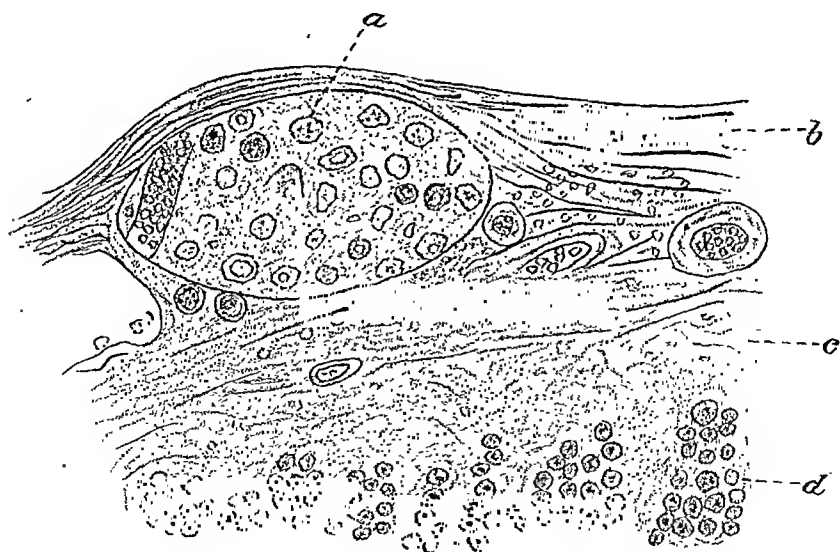
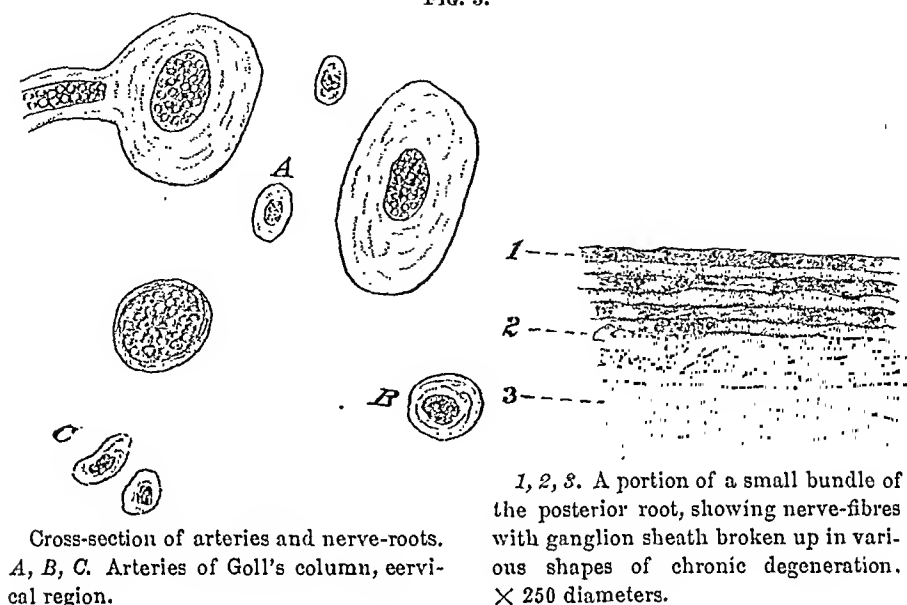


Nerve-fibres in different stages of degeneration. 1. Long fibres of Goll's column.
2. Short fibres of Burdach's column.

conceded that the fibres are damaged between the ganglia and the cord, the fibres of Goll's column suffering much more on account of their long course (just as in primary lateral sclerosis the cross-pyramidal tracts are affected probably on this account). The vessels in the thickened membrane, and particularly in the sclerosed portion of the cord, presented a remarkable appearance, viz.: an enormous thickening of the walls of the small arteries and arterioles (Fig. 3), and it is possible to

connect the complete destruction of the long fibres of Goll's column, with an arrest of nutrition due to this disease of the small vessels. It

FIG. 3.



First sacral, anterior root cut transversely. $\times 250$ diameters. (GARDINER.)

seems to be of the nature of an arterio-capillary fibrosis, or rather a chronic periarteritis. The other columns of the cord showed no degenerative changes, and the fine nerve¹ plexus around the cells in Clarke's

¹ Krauss: "Im Pathologischen Anatomie der Tabes Dorsalis." Neurologisches Centralblatt, February, 1885.

column, which is the first seat of degenerative changes in locomotor ataxy, showed no atrophic change, proving conclusively that the short fibres of the postero-external column had not suffered. But there was a scattered degeneration in the lower dorsal region in Burdach's column. This was due to fibres belonging to Goll's column passing through in a median direction. The wing-like area of degeneration seen in the upper part of the cervical enlargement, Fig. 1, *b*, is due to the fibres of the brachial roots coming in.

Abstracts of cases of degeneration of Goll's columns.

(The sections were cut in celloidin and stained by the Weigert method.)

(I.) Degeneration der Goll'schen Stränge bei einem Potator. (Vierordt, Leipzig, *Archiv. f. Psych.*, 1886.) A laborer, aged thirty, a heavy drinker, non-syphilitic, suffered with frequent stabbing, lightning pains in the lower extremities, likewise with weakness and uncertainty of the latter. No ataxy; normal muscular sense, normal sensibility of the skin. No tenderness on pressure of the nerves, but great pain on pressure of the muscles. Diffuse wasting of the muscles of the lower extremities, diminution of strength, but in proportion to the volume. Some ataxy of movements. Slight paræsthesia on the outer side of the calf. No hyperæsthesia, normal muscular sensation. Ataxic gait, inability to stand with the eyes closed. Loss of knee-jerks, skin reflexes remain. Normal reaction of muscles. Pupils, bladder, and rectum normal. For some time improvement, then a new symptom—creeping sensation in the legs. Later on, the upper extremities began to waste.

Autopsy: Sclerosis of Goll's column—chronic leptomeningitis—disease of some of the roots, but the greater number were not degenerated. The sciatic nerve was examined and found to be normal. Vessel-walls of the membranes of the spinal cord greatly thickened.

The author considers the case to be one of primary descending degeneration of Goll's column.

(II.) (Friedreich. *Über progressive Muskelatrophie*, Berlin, 1873.) A case of degeneration of Goll's column, and especially of the anterior and posterior roots, with enormous degenerative atrophy of the muscles. It occurred in a woman, aged thirty-five, who suffered with violent burning pains; atrophy of the legs first, then of the hands and forearm, then of the upper arm; sensibility remained normal. Sphincters natural.

(III.) (Pierrot. *Archiv de Physiologie*, 1875, p. 74.) This author describes the spinal cord of an old woman who, during the last eleven years of life had suffered with formication in the arms and legs, with very slight diminution of sensibility. In this case there was a sclerosis limited to Goll's column.

The points of interest in these cases are:

1. That Goll's column may be connected with the conduction of impressions relating to the muscular sense, or that the fibres of these columns have some other function not yet determined. The singular absence of visceral complications in these cases does not lend support to Dr. Tooth's view that Goll's column conducts visceral sensations.

2. The resemblance clinically between the case here recorded and that recorded by Vierordt—viz., briefly summarized in both cases, a history of alcoholism, pains in the lower extremities followed by wasting, no loss of sensation (excepting a muscular sense); after a time the upper extremities affected in a similar manner to the lower, death from tuber-

culosis. The pathological condition met with in the cord was also very similar, both as regards the area of degeneration and the partial affection of the roots. The complete destruction of Goll's column, excepting a few fibres posteriorly in the cervical region and medulla, and the absence of degeneration elsewhere in the cord, both in the other tracts and the cells and fibres of the gray matter, were present in both.

3. The absence of knee-jerks (and even the inability to stand with the eyes shut, noticed by Vierordt in his case) could be accounted for by the degeneration of the terminations of the motor nerves, which would also explain the wasting of the muscles. The degeneration of the motor nerve-endings might be explained by the alcoholism or by the leptomeningitis, causing nutritive disturbances of the anterior roots. In my case, and also in Vierordt's to a less degree, some of the anterior roots showed degenerative changes. The centre of nutrition, even of the end-plate of a motor nerve, is the ganglion-cell. Although the leptomeningitis may not have been severe enough to interfere with the nutrition of the whole nerve-fibre, yet it was sufficient to produce a degeneration of the terminals, especially of the long fibres of the legs and arms, which are proportionally much more remote from their seat of nutrition than the nerves to the trunk-muscles.

With regard to Goll's column, the same inference may be drawn. The complete destruction of this column in the cervical region, whereas hardly any trace of degeneration can be seen in the lower lumbar and sacral regions, may be explained thus. The seat of nutrition of the fibres of Goll's column is the spinal ganglion. We have seen that the ganglia and the roots are involved in an inflammatory process, with great thickening of the vessel-walls. The portions of these fibres most remote from the seat of nutrition will suffer; consequently the fibres which come from the leg will be degenerated most high up in the spinal cord. We can only explain in this way the complete escape of the short fibres which make up the postero-external column, and which soon come to their station in Clarke's column, hence are not atrophied (*vide* diagram). Vierordt considers that Goll's column in his case degenerated downward, and I think the above explanation would coincide with this view.

Moreover, we have in the (so-called) idiopathic lateral sclerosis a confirmation of what I have regarded as the explanation of sclerosis of Goll's column. In this disease the long fibre-systems of the cross-pyramidal tracts are alone degenerated, and the process invariably commences in the legs, because the fibres going to the anterior horns of the lumbar and sacral regions have a much longer course, and are more remote from their centre of nutrition, hence more readily undergo degenerative changes when their nutrition is interfered with, for even the terminals

of the fibres are dependent for their nutrition upon connection with the ganglion cells from which they originally grew.

Another explanation of the degeneration of Goll's column to the exclusion of all others has been suggested—that is, an encroachment of the fibrous tissue, which certainly is more marked in the posterior median column of the cervical region of the normal spinal cord.

ANTISEPSIS AND ASEPSIS BEFORE AND AFTER MAJOR GYNECOLOGICAL OPERATIONS.

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WHILE operative surgery is ever a more brilliant subject for a discourse, there are some plain matters which lie at the bottom of all successful work about which surgeons are not yet practically united, and my observation for some years past has taught me that the rising gynecologists need above all else minute painstaking instructions in these fundamental principles—the practical significance of “sepsis,” “antiseptis,” and “asepsis.” The greatest gynecological want is that men should be taught to apply in the simplest way the recent teachings of bacteriology.

The touchstone revealing the character of a man's work is the view he holds of this important question.

“Cleanliness” (microscopic), the methods of securing it, and the methods of maintaining it, are the very bone and marrow of all good surgical work to-day.

“Sepsis”¹ is a morbid condition of the body, due to the action of specific germs, which are the septic agents.

“Antisepsis” is any efficient means put in action by which these germs are rendered inactive, destroyed, or removed from the body.

“Asepsis” is the condition of the body, or a part of the body, free from septic germs.

Cleanliness in this sense is asepsis, and is microscopic, not macroscopic.

These definitions at once do honor to the great army of workers who, within the past twenty years, have shown us why suppuration and sloughing (septic processes) were wont to prevent the rapid healing of fresh wounds. They at the same time place a wide gulf between those

¹ “Sepsis” is used in this connection as a convenient general term to designate traumatic infections.

who thus accept the conclusions of our contemporaries working in the bacteriological field, endeavoring to ground all their surgical work upon the principles by them laid down, and those on the other side who, with a remarkable pertinacity, still insist that nothing new has been discovered, and that scientific surgery has received no riches from the bacteriological laboratory; even resorting to an unworthy *double-entendre* on the word "*cleanliness*," trying to confuse the new "microscopic" with the old "macroscopic" cleanliness, to prove that "since the fathers fell asleep all things continue as they were."

This microscopic cleanliness is the keynote of all successful gynecological surgery, and must pervade the work from beginning to end.

The great growth in the success of gynecological operations within the past few years has been due to the simplification and perfection of the means taken to secure this important end, with the abandonment of the complicated unnecessary machinery at first hastily thrown up to protect our patients, as soon as we learned that the enemies to our success were the hardy, minute, all-pervading microorganisms.

I shall in this paper dwell at some length upon this and some other important principles, controlling all of our gynecological work, illustrating the application of the former by means of major cases, with a clear understanding that the same laws apply to the lesser or minor gynecological cases—here, as elsewhere, the major thus including the minor.

The applications of these principles to a given operation must be considered at three different periods:

First. The condition of and the preparation of the patient for the operation, and the preparation of operator, assistants, instruments, and dressings.

Second. The personal cleanliness of the operator and his assistants during the operation; and

Third. The care of the patient and the wound after the operation.

THE SELECTION OF THE PATIENT.

It is important that a gynecological operator should first learn to select his cases with care, making sure that no grave organic disease complicates the local trouble, that there is no other coexisting ill from which the patient must soon die, even if she be cured of a tumor or other pelvic ailment.

An oversight of this kind is often attended by the most serious immediate consequences, and lives are thus frequently shortened, which could have been preserved for months or years by a little more insight and careful preliminary analysis. Surely nothing can exceed the chagrin of a specialist who has had the narrowness of his horizon demonstrated by any such accident.

I venture, therefore, to name in a brief review some of the chief stumbling-blocks which I have thus repeatedly found in my way.

To avoid this error a careful history of every case must be taken, including notes upon family tendencies to particular diseases, such as cancer, Bright's disease, phthisis. An examination should always be made into the patient's mental condition, with inquiry about insanity in the family, or previous attacks in the patient. It is well known that a fresh attack of mania may be precipitated by an operation, and a great many patients in gynecological hospitals are paranoiacs. Next look into the condition of the heart and lungs. I have seen a patient with a large dilated heart die from the simple tapping of an ascites. With a hydrothorax it would be dangerous even to give an anæsthetic.

If the heart has a valvular lesion I prefer chloroform anæsthesia, which I have thus employed repeatedly.

Phthisis, however, even when far advanced, does not necessarily contra-indicate operation. Some nine years ago I operated on the relaxed vaginal outlet of a woman so far reduced by this disease that she could scarcely drag herself from room to room. She at once improved remarkably, and for years seemed comparatively well, and is, for aught I know to the contrary, living to-day.

I would even recommend the removal of tuberculous tubes and ovaries, and draining a tuberculous peritonitis in a phthisical patient, where the abdominal disease has advanced so far as to be distressing to the patient. The improvement in such cases is sometimes very great and prolonged.

Below the diaphragm lie a number of dangerous traps for the unwary gynecologist.

Abscess of the liver may prove a complication. I recently lost a case where there was gangrene of the right ovary and tube, with gangrene of the vermiform appendix, which had sloughed off at its attachment to the colon. The patient recovered from the operation, got up, and went about, but died on the twenty-sixth day from a large concealed metastatic abscess in the liver, arising from the gangrenous appendix, transmitted through the portal system. The abscess ruptured into the bronchial tube, and drowned her at once.

Cancer of the ovary is not unfrequently complicated by a cancer of the pylorus, which makes pelvic operation futile. Two such cases have occurred in my experience. In the first, I operated removing the large brain-like ovary. The patient recovered, and went home, and died some months later of her pyloric disease.

In the second case I refused to do more than tap the abdomen, removing a large ascitic accumulation. The autopsy confirmed the diagnosis, revealing as well disseminated cancerous plates on the peritoneum.

A peri-appendicitis with adhesions is frequently found associated with tubo-ovarian inflammatory diseases, and in no way contra-indicates opera-

tion. In one of my cases of pyosalpinx there was, as well, an independent abscess of the vermiform appendix.

Of all the organs in the body whose functional activity is vitally important to the convalescent, after a serious gynecological operation, the kidneys may be said to be paramount, and the writer would feel himself criminally negligent if he failed in any instance to determine the exact condition of the renal secretion before opening the abdomen.

Careful statistics will show that with the expulsion of sepsis from the mortality record after gynecological operations, uræmia has stepped very high in the list of fatalities.

Without entering into the causes, we have but to recall the familiar facts that the prolonged presence of pus in the body is productive of serious changes in the kidneys, heart, and liver; and again that the gonorrhœa which produces the pyosalpinx, may produce at the same time, by travelling up the bladder and ureter, a pyclo-nephrosis; and more important still, because most frequent, we must recall the fact that any mechanical obstruction to the flow of urine tends to produce nephritis.

My work has abundantly proven these observations, showing that the presence of pelvic tumors is frequently a cause of albuminuria.

In the ninth paper of my recent work, I issued a preliminary report on the urinary examination of ninety-five gynecological cases.¹ Out of these were fifty cases of abdominal section taken successively, showing the presence of some albumin in fifteen instances, or thirty per cent.

In eight of the fifteen, hyaline and granular casts appeared. Thus sixteen per cent. had both albumin and casts in their urine. The significance of this discovery may be appreciated by citing such an extreme case as that in the third article of the report (*v. supra*), where a colored woman died (without operation) of the renal changes induced by a large myoma uteri. The anatomical diagnosis reads: "Myoma of uterus, with central necrosis; dilatation of ureters from pressure; pyelo-nephrosis; chronic passive congestion and emphysema of lungs; displacement of viscera and deformity of thorax, in consequence of tumor. General marasmus. Heart hypertrophy, with hyaline calcific and fatty degeneration."

I do not as yet wish to lay too much stress on these figures, which are astonishingly large, but insist that if only one or two per cent. are found to be thus affected, the investigation is a vitally important one!

Albuminuria and milder grades of Bright's disease are not contraindications: I do not hesitate to operate where I find albuminuria and even casts; but when it is necessary to operate on such cases, it is better to be forewarned as to the dangers, so that by using chloroform, and

¹ The Johns Hopkins Hospital Reports, vol. ii., Nos. 3, 4, Paper ix.

shortening the time of the anæsthesia, and by supplying external heat, the shock to the system may be as slight as possible; also by the use of the drainage-tube we may avoid to the utmost any taxation of the emunctories. We must also avoid opiates, and by free purgation save and supplement the crippled renal emunctory to the utmost. Advanced Bright's disease is an absolute contra-indication against any elective gynecological operation requiring anæsthesia.

In three cases out of fifty, two pus cases and one large ovarian tumor, in which albumin with hyaline and granular casts was found before operation, the urine exhibited nothing abnormal upon their discharge from the hospital, showing that the tumors had acted as causes in producing the renal disturbance.

PREPARATION OF THE PATIENT FOR THE OPERATION.

The guiding rule in fixing the date for operation is to take as much time as is necessary to get the patient in the best possible condition her disease will admit of. In a suppurative peritonitis, and ruptured extra-uterine pregnancy, there is, as a rule, no time for previous preparation beyond the administration of a purgative and enema and some stimulants, while the surgeon is getting to the patient; but in almost all other cases we shall do better to make haste slowly.

With rest in bed for one or two weeks or longer, and with careful feeding five or six times a day, a wretched, pinched, and worn-out body will usually recover some of its pristine vigor, and be thus better able to stand the shock of an operation.

It is of paramount importance in this connection to recognize the fact that ovarian and tubal abscesses are naturally characterized by repeated attacks of pelvic peritonitis, confining the patient to bed for one or more weeks with a swelled abdomen, quickened pulse, elevated temperature, and severe abdominal pains. But after one of these attacks is over, the patient usually improves until she feels quite well again.

It is better not to operate during such an attack, but to wait for the interval of comparative health and strength, when the operation will be better borne. One must, however, carefully distinguish the profounder shock with collapse, due to an abscess ruptured into the free peritoneal cavity, a condition admitting of no delay.

Where the operator selects his own time for an operation, he should at once begin not only to tone up the patient's general health by rest and feeding, but to quicken the action of the skin and the bowels by baths and free evacuations, and to prepare the abdomen and genitals by daily washing, and two or three days beforehand by careful scrubbing, along with daily vaginal douches, one pint of a solution of bichloride of mercury (1 : 5000) or carbolic acid (3 per cent.).

A thin poultice of *sapo viridis*, one foot square, laid on the abdomen two hours beforehand, softens the superficial layer of epithelium for the last washing, which it receives on the operating-table. A half-hour before the operation the patient receives forty grains of the subnitrate of bismuth, and, if there is no contra-indication, a quarter of a grain of morphia. The latter makes the patient more susceptible to, and less anxious about, the anæsthetic, and the bismuth acts by contracting the intestines and thus allowing more room to work in the abdominal cavity.

INSTRUMENTS, LIGATURES, DRESSINGS.

Five years ago I used for the disinfection of my instruments a double-walled copper oven, raised to the temperature of 140° C. (315° F.), for an hour. It was then demonstrated by bacteriologists that moist heat at 212° F. (100° C.) was even more effective.

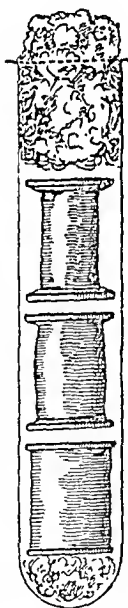
It is now more than a year since I brought from Europe a newly-devised Rohrbeck oven for disinfection by steam. It is possible in this apparatus, after due exposure to the steam, by turning a ventilator and shutting off the heat, to convert it at once into a drying oven, thus automatically drying the instruments and dressings.

My final step in this direction was taken some months ago when I adopted a simple copper steam-sterilizer (Arnold's), made in America, for the disinfection of instruments and all dressings. Dr. Abbot's tests have shown this to be thoroughly reliable, giving a uniform heat of 212° F. in all parts of the cylinder, and its simplicity commends it for all practical purposes.

After an operation of a septic nature, the instruments are first washed, and then sterilized for a half-hour in this boiler, when they are taken out and dried at once. Again before the next operation they are laid in the sterilizer for a half-hour, when they are removed and placed in the trays and immersed in water, ready for use. As soon as the instruments are removed, the dressings—absorbent cotton and bandage—are put in, and left there until required at the close of the operation.

So satisfactory, so thorough, and so reliable is this steam disinfection, that I have also entirely given up boiling the silk ligatures, as well as the use of any antiseptic solutions, as heretofore, in their preparation, adopting instead a plan invented by Dr. Halsted. The silk is cut in required lengths and wound on glass spools, these are then put in a long test-tube of large calibre, plugged with cotton, in the same manner as the gelatine culture-tubes. (Fig. 1.) The tube thus loaded is placed

FIG. 1.



in the steam cylinder for a half-hour without removing the cotton; it is then taken out, and put back again for a half-hour on the following day, when the sterilization is absolutely certain.

The cotton plug must not at any time be removed from the tube until the ligatures are needed for use. Silk prepared in this way retains all its strength and remains sterile indefinitely until the tube is uncorked.

With the steam thus in constant use, towels and gauze, and even long stockings drawn over the legs in perineal operations, are also readily sterilized without the use of any antiseptic solutions.

THE OPERATOR AND THE ASSISTANTS.

The operator and his assistants should spend not less than ten minutes in scrubbing their hands with soap and warm water, devoting particular attention to the nails. That this alone is not sufficient to remove all the pus germs from the fingers, I have demonstrated in a series of experiments in which Dr. Ghiskey, the gynecological assistant, has each time succeeded in getting staphylococcus cultures after the most thorough, careful scrubbing on my part. Moreover, the cultures thus made were always taken from the nail of the index finger of my left hand, to which I had devoted the most painstaking attention in the cleansing. I follow this washing with water by an immersion of the hands for a half minute in a saturated solution of potas. permang., this is next removed by a saturated solution of oxalic acid in water, and finally the hands are immersed in a bichloride of mercury solution (1:1000) for one minute.

I am at present conducting a series of experiments to determine whether the danger of infection is as great after the bichloride as after the soap and water, when I shall be able to decide on scientific grounds as to the further use or the discontinuance of the drug.

When the patient is placed on the table for operation, her abdomen is first washed with soap and water followed by ether, and finally the bichloride in water (1:1000). The field of operation thus prepared is secluded by aseptic sterilized towels, placed across the chest and over the thighs and on either side; a piece of gauze, large enough to reach from the chest to the knees, covers the whole abdomen. A slit is cut in the centre of this, and when its edges are pulled apart the abdomen is bared from umbilicus to pubes. Through this opening, thus protected on all sides, the operation is performed.

The central idea which must dominate operator and assistants throughout the operation is, that having thus come to the work under conditions absolutely aseptic, they must be kept so throughout. There must be no break in the phalanx, such as occurs when operator or assistant shakes hands with visitors or touches unprepared parts of the patient, or an assistant dips water out of the reservoir with a cup or

pitcher which has been standing on a table or shelf not included in the field prepared for the operation, etc., *ad infinitum*, including hosts of slips in the technique, only avoided after long experience, which finally develops a keenness of perception for inconsistencies in the technique which may well be designated an "antiseptic conscience."

It is true that all these antiseptic precautions are frequently set at naught by the amount of sepsis encountered inside the patient as soon as the abdomen is opened.

Shall we for this reason relax our precautions and be careless about outside contamination even in these cases? By no means; the rule must be in all cases the utmost cleanliness attainable under the circumstances, even the worst. The principle must never be voluntarily sacrificed by the operator. In addition to this we cannot be sure of such hastily-drawn conclusions, for much of this ill-looking pus found in tubes and ovaries contains no germs which can be demonstrated, and is often, if at all, but mildly septic.

ASEPSIS AFTER THE OPERATION.

After a clean aseptic operation one great danger of septic invasion is from suppuration in the wound in the abdominal wall. Every effort should, therefore, be directed toward securing primary union. Septic material may work into the lips of the wound, or down the suture-tracks, the silk sutures acting like setons, the poison thus even penetrating the abdomen and causing death. A stitch-hole abscess in the abdominal wall is, unfortunately, a common sequence to an abdominal operation. This painful complication, which so seriously retards the recovery, can best be avoided by the following measures: the abdominal wound must be accurately approximated by the sterilized silk sutures, deep and superficial, three or four of each to the inch. The whole line of the incision thus closed is then coated with a mixture of iodoform and collodion (1:15) in a viscid state. This mixture is applied to every suture, with especial care to *saturate* every visible part of it with the viscid fluid, which dries at once. By this means the wound is concealed and the silk sutures are transformed from a bundle of threads with powers of capillary attraction, into a solid cord, like silkworm-gut or silver wire. The whole wound is at once dusted thickly over with iodoform and boric acid powder (1:7), which adheres tightly to the collodion. This makes an admirable occlusive dressing. A few layers of simple sterilized absorbent cotton are next applied, and finally over all a many-tailed bandage, held down by two tails between the thighs, pinned in front.

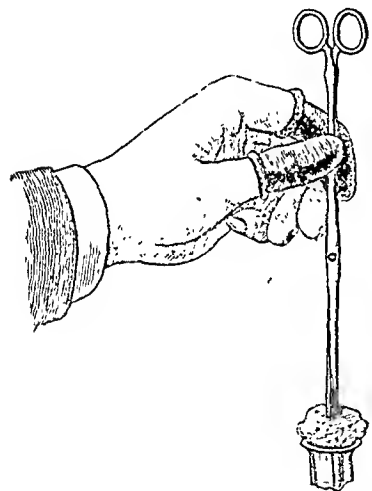
Whenever a drainage-tube is inserted, which translated practically means, whenever an open hole is left in the abdomen, the dangers of infection, after the operation, are greatly enhanced. The open tract down into the abdomen, with the presence there of free serum, as a culture medium, affords an excellent nidus for infection. The sepsis

thus entering does not come from the air, nor apparently from the surrounding skin of the patient, but from the hands of the man who dresses the tube. A ready explanation of this exists in the fact that it is impossible, where a number of cases need dressing, to cleanse the hands each time with the same thoroughness considered necessary before an abdominal section; and yet the wound is the same, and the same absolute cleanliness is certainly called for.

My treatment of the tube is as follows: Just before applying the dressings and bandage, a small piece of sponge is grasped in the tube-forceps (specially constructed for the purpose) and the tube is cleaned with this until it is dry; a long, loose roll of gauze is then laid in the tube, which acts by capillary attraction, continuously sucking up and discharging fluids from the floor of the pelvis on to the dry absorbent dressings above.

In the subsequent dressings the tube is cleaned, first by lifting out the piece of gauze saturated with blood, then one of a number of little

FIG. 2.



Hand grasping tube-forceps.

balls of sterilized cotton, about a third of an inch in diameter, kept in a glass-stoppered bottle, is picked up in the tube-forceps and carried to the bottom of the tube, at once soaking up any fluid lying there; this is then thrown away, and the process repeated until the tube is dry, when a gauze plug is again inserted until the next dressing. The great danger of contamination lies in handling the tube, and the gauze, and cotton dressings which enter it. To avoid this, I have arranged that while manipulating the drainage-tube and cotton balls, the thumb, index, and middle fingers of both hands are covered with rubber finger-stalls, taken out of a carbolic solution and washed and put back

after using. By using these it is easy to prevent the naked skin from coming into contact with the tube or any substance entering it. As soon as a free discharge from the pelvis ceases (generally from the second to the third day after operation), the tube is pulled entirely out, and the hole obliterated by drawing up the loose suture lying in its track and left untied for this purpose.

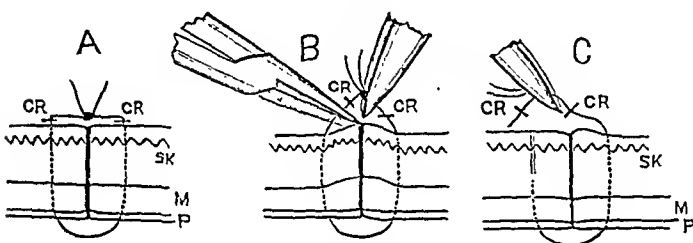
The catheterization of the patient is not a minor matter, but one of the most important procedures, for by means of the catheter, through carelessness, a violent cystitis can be excited. To catheterize, the nurse

must expose the parts, cleanse the genitals, very carefully wiping the orifice of the urethra with a little absorbent cotton, and only then catheterize when it is impossible that any foreign matter can be carried up into the bladder on the point of the catheter from the outside.

The sutures closing the abdominal incision should all be removed in from seven to eight days. Care must be taken in their removal not to convert this simple step into a source of irritation or infection of the wound.

There is usually a little cake of incrustated lymph and powder where the suture emerges from the skin; and in removing the suture its loop must not be cut above, but below this point, where it is moist and pliable; this will avoid dragging the ragged foreign mass clinging to the suture, through its whole long track and through the peritoneum. To get the suture out, catch its free ends in a pair of dressing-forceps and pull it up a little, and then carefully clip one side of the loop in the moist

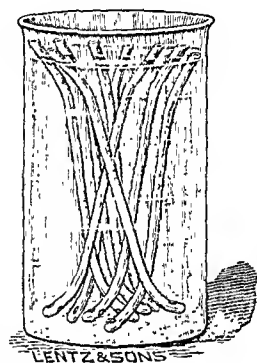
FIG. 3.



Removal of the abdominal suture.

A shows the suture *in situ* passing through skin, muscle, and peritoneum. CR, CR are the little masses of incrustation of hardened lymph, discharged from the suture-track. *B* shows the removal of the suture, elevated and cut below the crust. *C* shows the direction in which it is to be pulled out.

FIG. 4.



Glass catheters.

part; then remove it by pulling it toward the side on which it has been cut. If the pull is made in the opposite direction the tendency will be to drag the freshly-united surfaces apart.

I have for years used nothing but glass catheters, which are cheaper and cleaner than any others. Several of these can be conveniently kept in a large test-tube, closed with cotton and sterilized in the same manner as the ligatures. Or, they can be kept standing in a five per-cent carbolic acid solution in a jar with some cotton on the bottom, to prevent them from breaking when dropped in. Each catheter should be washed thoroughly after using it, and preserved in the solution until wanted again. A sigmoid self-retaining catheter can be readily made from one of these over the alcohol lamp. My catheters are now in general use all over the country.

ASEPSIS AWAY FROM THE HOSPITAL.

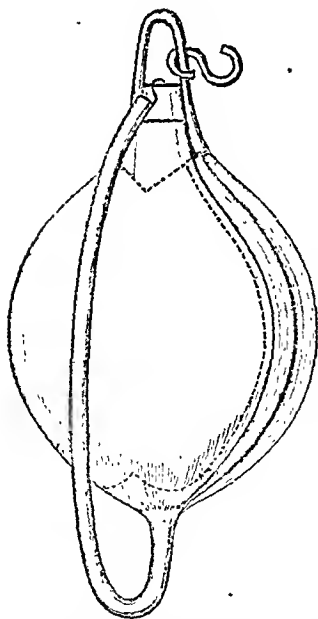
It is manifestly not very difficult with careful training amidst all the conveniences of a specially-prepared clinic, to keep up an aseptic condition for any given length of time.

A question of the utmost practical importance, which has not yet been answered, is, "How far can we successfully apply these principles to emergency cases, and to operations in private houses?"

The difficulties in the way of operating aseptically in private, especially among the poor and middle classes, are due, in part, to the unskilled voluntary assistants in the preliminary preparations, and to the use of various household vessels and utensils whose microscopic cleanliness is uncertain—thus, the water used, the boiler, the pitchers and the basins, and the towels are each and all open to grave suspicion. These sources of error in the technique are dangerous, and must hang like a pall on the conscience of a careful man. They can be avoided by the following simple devices. Instruments which have been sterilized are put at once in tin, copper, or nickel-plated boxes, and, together with the ligatures in the sterilized tubes, and the dressings wrapped in wax paper, should be carefully packed away in the operator's kit ready for a call at any moment. It is important to avoid using domestic towels, plates, and other dishes by providing one's self with instrument and ligature trays, of hard rubber, porcelain-coated, or glass.

A convenient and cheap dish for ligatures, needles, and needle-holder, is a clever adaptation of Dr. Robb's, consisting of a porcelain plate divided into sections large enough to hold all of these separately in the various compartments.

FIG. 5.



Collapsible rubber bag holding five quarts of water, used in place of a pitcher.

Three difficulties and inconsistencies remain to be overcome: the water, the boiler, and the pitchers, not one of which is safe for use as it is handed to us labelled "clean" by the housewife or servant. I have overcome this weakness in the technique by carrying a copper boiler with me, 11x16x10 inches, which just fills the leather case holding my instruments, trays, and dressings, all of which are thus packed into the boiler.

I use instead of pitchers a bag made of rubber, ending in a hose below, holding five quarts. This is hung up by the hook, and the water is drawn off by unhooking the hose hanging on the lip of the bag and letting the end down, when the water rushes out into the basin. Tap-water boiled for an hour is perfectly safe.

To such an extent has the elaborate technique of antiseptic surgery been simplified. Let no one imagine that there is any relaxation of the "antiseptic conscience." The appear-

ance of laxity in dispensing, as far as possible, with antiseptic drugs, is in appearance only; the fact is, that in disposing of these means the necessity of keeping the principle constantly in view is all the greater and more urgent. If I shall have thus elucidated the principles and persuaded one man to exercise more care in securing and maintaining microscopic cleanliness in his work, and if by any simplification of the technique I have made the difficulties in the path of rigid scientific cleanliness seem a little less, I shall feel well rewarded for my efforts.

THE SURGICAL TREATMENT OF ANEURISM OF THE ARCUS AORTÆ, WITH A CASE CURED BY THE LORETA-BARWELL METHOD.

BY JULIUS ROSENSTIRN, M.D.,

SAN FRANCISCO, CAL.

THE surgical treatment of aneurism of the first two-thirds of the arch of the aorta and anonyms deserves more consideration than the general practitioner is ready to grant it. The recognition of the disease has been generally associated with an absolutely hopeless prognosis. A more or less energetic trial of the improved Valsalva, or Tufnell-Balfour treatment, is made, and that failing, the patient is left to his fate. In view of the comparatively numerous favorable results obtained by surgical treatment in cases where the combined rest and iodide of potassium treatment failed and symptoms of immediate danger to life had appeared, hesitation to apply surgical measures seems unreasonable.

The term "Surgical Treatment of Aortic Aneurism" unites under its heading methods of great variety. Electrolysis, the introduction of various foreign bodies into the aneurism, alone or combined with the application of electricity, and last, but not least, the ligation of the right or left carotid and subclavian arteries, either simultaneously or separately, have been recommended. Most of these have given undoubted results in cases with the most urgent and dangerous symptoms. Brasdor's operation, the ligation of the carotid and subclavian arteries, shows the best record, especially if done simultaneously. In an essay that appeared about three years ago in Vol. xxxiv. Part I. of Langenbeck's *Archives of Surgery*, I have compiled all the cases of Brasdor's operation for aneurism of the arcus aortæ and anonyms up to 1885. Of the 38 simultaneous operations, 6 had been made before the time of Lister, 32 with antiseptic precautions. Of these 32 cases, 14 had lived one year and longer after the operation, able to work; 5 were greatly improved; 5 were not improved, and only 8 died within the week immediately following the operation. Similar, though not quite as favorable, results were obtained by the separate ligation of the two arteries, as also by the single ligation of either the right carotid or subclavian. Even the ligature of the left common carotid, in 6 cases of

aneurism of the transverse part of the arcus aortæ, has given 2 cures of one year and longer, 2 improvements, and only 2 deaths.

Timothy Holmes operated October 21, 1875, on a woman, twenty-one years old, with large pulsating swellings in the first and second intercostal spaces, no pulsation in the arm arteries, and loss of voice in consequence of paralysis of one vocal cord. The pulsating tumor disappeared, she regained her voice completely, and in the meeting of the Royal Medical and Chirurgical Society of February, 1883, eight years after the operation, the operator spoke of her being at work at the time in a position as housekeeper. My own case of simultaneous ligature of the carotid and subclavian arteries, in a woman forty-two years old, is the second longest cure on record.

After having subjected my patient to a long but ineffectual treatment by other methods, I operated on her November 26, 1883. The case was brought, before and after operation, before the German Medical and the San Francisco Medical Societies. The woman is comfortable, and at work to-day.

The patient whose case I report has been operated upon by the Loretta-Barwell method, the introduction of wire into the aneurismal sac, combined with electrolysis. The excellent result obtained justifies my calling attention to it, and seems to me a unique illustration of the curative possibilities of modern surgery in these cases when assisted by youth and vigor.

Founded on Bacelli's recommendation of the introduction of fine watch-springs, Loretta originated the operation of introducing fine silver wire into aneurisms, and Barwell proposed to combine electrolysis with it. His first case, in 1886, proved unsuccessful; a second one was operated upon by Dr. Kerr with the same result. In a third case, however, a man of fifty-six years, he succeeded in improving the patient's condition materially, although swelling and pulsations remained.

My patient, born in 1864, showed an early but decided inclination toward obesity. When twelve years old he weighed 230 pounds, but reduced his weight after entering Harvard, November, 1882, by training for the class crew of 1886. The training consisted of rowing from four to ten miles daily, or exercises with chest-weights, dumb-bells, etc. Dietetic rules were to abstain from sweets, alcohol, and tobacco, and an urgent request made to retire by 10 o'clock at night. This last recommendation was rarely acted upon. Several practice races were rowed, until the great Columbia race in July, 1883, took place (at that time his weight was 185 pounds). The Harvard crew won under great strain. After coming home he suffered from palpitation of the heart, and Dr. Bennet, whom he consulted, thought there was an incipient aneurism. On his return to Cambridge he again began to row, but had soon to give it up and submit to treatment. By the beginning of 1885 the disagreeable symptoms had mostly disappeared. He retired from active engagement in athletic sports, but gained a prominent position in the fast set of Harvard. He became a devoted Lutheran; he loved wine, women, and song—the two former most. He consulted me for the

first time in May, 1888, previous to an intended trip to New York. His weight at that time was between 250 and 260 pounds. He suffered from palpitations of the heart and slight dyspnœa. From my notes I glean that his pulse was weak (90) and somewhat irregular. I noticed a faint but distinct bruit, commencing over the second right intercostal space and extending to the right fossa supra-clavicularis. I gave him very strict directions about exercise and diet, and he left for New York. During the four months following until I saw him again, on October 13, 1888, he gave himself up to an unbroken series of excesses in *Baccho et Venere*. On that day he had what was described to me as a fainting-fit, and I was called in. He had gained some in flesh. His pulse was 100, very weak and intermittent, the right hardly perceptible. Upon examination, I found a distinct pulsating tumor occupying the second and third intercostal spaces in the right parasternal line; no discoloration of the skin. Percussion showed a dulness of about two inches square in that region. Auscultation revealed the usual aneurismatic bruit over the tumor. The apex-beat was obscured by the immense layer of fat, and percussion could not distinctly outline a suspected dilatation. The first sound seemed clear, the second was changed to a loud bruit. Absolute rest in bed was immediately ordered, and he was put on low liquid diet, with large doses of iodide of potassium and cautious massage of extremities.

This treatment was strictly kept up for three months without any apparent effect except that his solid flesh melted and his pulse gained more regularity. He suffered during this time excessive pains in his right shoulder and arm, and protracted attacks of suffocation, which, in several instances, necessitated inhalations of oxygen and the aid of artificial respiration. I had spoken to the family of the various surgical interferences and proposed to try simultaneous ligation of the carotid and subclavian arteries, but they very strongly objected to any cutting operation, and asked me to give electricity a complete trial first. On January 13, 1889, accordingly, I inserted an insulated needle, connected with the positive pole of a galvanic battery, into the aneurismal sac. An Apostoli electrode connected with the negative pole was placed over and to the left of the sternum; sixteen large-sized cells were used. The galvanometer showed about 70 milliamperes, the current was applied during twenty minutes. On January 26th the operation was repeated with two needles. The effect of both operations was *nil*. As the symptoms grew rather more aggravated, after a consultation with my *confrères*, and assisted by Dr. Hahn, I performed the Loretta-Barwell operation on February 24th. I took an explorative trocar in order to be able to use a larger-sized wire than had been employed heretofore. I drew the skin from near the axillary line toward the tumor, penetrated and went into the aneurism. During six or seven minutes a slowly increasing current was directed through the trocar until the same number of elements was at work as before. The lance of the trocar was carefully withdrawn and about twenty-six inches of spirally wound, moderately thick, softened silver wire, such as would be used in tracheorrhaphy (about No. 28), introduced through the canula. I was fortunate enough to be able to push the wire perfectly into the sac with the lance, and after an electrolysis of about thirty minutes withdrew the trocar, carefully drawing the skin into its place again. The patient bore the operation remarkably well. Salt-bags were applied over the aneurism as at the two previous operations. After a few days the pains began to subside, and after two weeks the breathing became easy

and no more attacks of suffocation occurred. There was a slight superficial sloughing of the skin where the trocar had entered and probably been imperfectly insulated, but no other untoward symptom followed. The tumor grew gradually smaller and harder, the pulsations less, until by April 15th they had entirely disappeared. The patient has been steadily improving; he is in the most excellent health, able to undergo any ordinary exercise, and weighs, with 6 feet in height and 43 inches around the chest, only 185 pounds.

The first sphygmographic tracings showed a marked influence of the, then existing, fatty infiltrations perhaps associated with degeneration of the heart-muscle (myocarditis). In the course of the Tufnell-Balfour treatment an improvement was witnessed. At the time of writing the sphygmograph shows yet a difference in the pulse of each side which the finger can hardly detect; but except this and a slight elevation and dulness on percussion at the former site of the aneurismal swelling, nothing remains to remind us of the former disease.

The excellent result obtained in this case is mainly due to the youth of the patient. Aneurisms of the arch of the aorta at his years are rare occurrences. The age over forty furnishes nearly all the cases, and arteries with atheromatous degeneration do not admit such a complete restitution of the normal type. I doubt very much if this operation should be recommended for persons of an advanced age with atheromatous degeneration. It would be better, after an ineffectual trial of simple electrolysis, if the symptoms are urgent, to perform simultaneous ligation after Brasdor. But something should be done in every case of aneurism of the arch of the aorta that does not yield to the Tufnell-Balfour treatment.

THE CORROSION METHOD IN THE STUDY OF THE ANATOMY OF THE EAR.¹

By B. ALEX. RANDALL, A.M., M.D.,
PROFESSOR OF OTOTOLOGY IN THE PHILADELPHIA POLYCLINIC, ETC.

THE method of corroding away the tissues of an organ after filling its cavities with a congealing mass has been long and profitably employed in studying hollow structures, and most beautiful results have been thus obtained by many anatomists. Following the lead of Lieberkühn, Meckel, and others, Hyrtl made especial use of the procedure, and a fine series of his casts in wax, including some of the ear, is in the Müller Museum. The ear, with its elaborate intricacy, is one of the organs in which the method can be most advantageously employed; and much has been done in this direction by Bezold, of Munich, whose valuable brochure upon the subject was published in 1882. Yet the method with wax was but a step in the advance to fine results; and the return to the use of fusible metal and the elaboration of the technique have furnished casts far more delicate, yet durable, than those before obtainable. Much

¹ Abstract of a paper read before the College of Physicians of Philadelphia, Nov. 5th.

credit for this advance, although a number of excellent casts made in metal by Dr. Goddard in 1831 may be seen in the Wister and Horner Museum, is due to Siebenmann, of Basle, who presented exquisite specimens of his work at the International Otological Congress in Brussels in 1888, and has since published an elaborate monograph upon the revelations thus made in the internal ear.

The writer was greatly impressed by the beauty of Siebenmann's specimens, and at once prepared to follow his example; but press of other work and lack of adequate material have long delayed the undertaking, and the preparations now presented form only a beginning of the series planned. It is hoped, however, that they will serve to bring the method into deserved notice, and that others will find how invaluable an aid it can be to them. Surely, in America, where perhaps fusible metal was first thus employed successfully, it ought to yield results second to none elsewhere obtained.

It is hardly necessary to point out that in this instance, contrary to what obtains in vascular preparations, the results gained are *negatives*, which represent the cavities, not the structures of the organ, and need for their full comprehension to be supplemented by preparations of the structures themselves. The important point is that they furnish tangible expressions of the details that are otherwise hardest to grasp; and as illustrating the value of such negatives, I can refer to the magnificent series of preparations by a similar but far more difficult and tedious method, with which Dr. Piersol captivated the Anatomical Congress in Wurzburg two years ago.

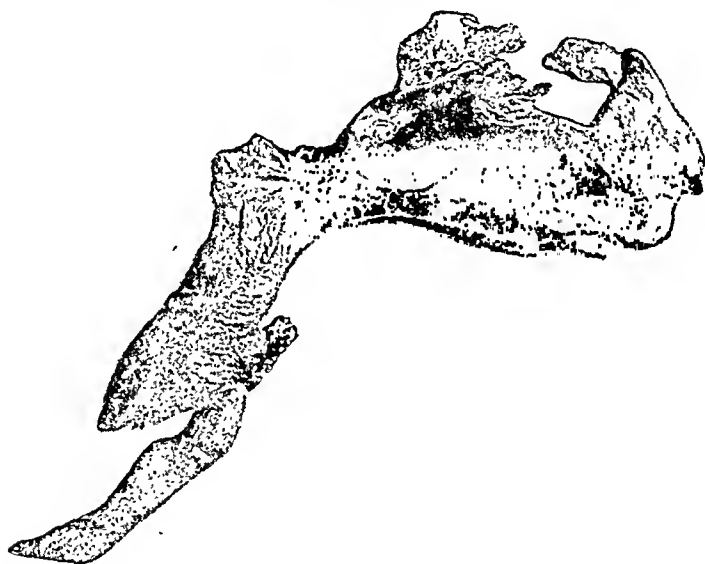
The essentials of the method are well known; but its minute details are noteworthy, since upon these refinements depends the perfection of modern results. The preliminaries vary with the organ to be moulded. If a macerated bone, such as the temporal, it is thoroughly dried and cleaned, is enclosed in linen so pasted on as to bridge the sulcus of the lateral sinus and other grooves, and to close all openings except the distal extremity of the carotid canal, into which a long paper funnel is glued. The whole is then imbedded in a large block of plaster, is thoroughly dried, and then warmed to about 200°. Wood's metal, a fusible alloy melting at 150° F., is melted upon a water-bath and poured in a full stream until the funnel is partly filled and the level ceases to sink. Quick cooling in water is followed by the removal of the plaster and linen envelopes, and the preparation is placed in a warm ten per cent. solution of caustic potash. Disintegration of the bone rapidly proceeds and will be largely accomplished in two weeks. The older procedure of picking away the remaining calcareous particles is too dangerous for the delicate portions of the cast, and is to be wholly avoided. The preparation is to be placed in a cold ten to fifteen per cent. solution of muriatic acid, which dissolves away the lime particles without injury to the metal beyond an occasional tarnishing. Superfluous metal

is then cut away, and the specimen mounted for preservation. For the soft tissues, injection by means of a syringe is sometimes necessary, since it is hard to raise the organ to the proper temperature for free flow without macerating its surface too much.

An exquisitely minute injection of the tissues can be obtained by these means, and the resulting casts, while very delicate, will bear careful handling without fracture or distortion, and are admirably adapted for demonstration purposes.

The practical results of such preparations can be valuable in the extreme, not only from an anatomical point of view, but in their bearing on practice, as two of those presented well show. No amount of reading as to the form and continuity of the upper air-passages can possibly

FIG. 1.



make as manifest their usual configuration and unity, as a cast obtained by pouring the metal into the trachea of the inverted head. The specimen (Fig. 1) is from a child of eight years, and falls far short of perfection; yet trachea, glottis, pharynx and nares are well shown, with clear indications of ventricles, fossæ of Rosenmüller, Eustachian tube-mouths, and other adnexa. Hardly any of the metal has found its way into the oral cavity, merely enough to outline the size and position of the uvula—showing how isolated the mouth really is from the air-passages. A more successful preparation of this sort, which should give as a single mass of metal the Eustachian tubes, tympana, and mastoid cells in their continuity with these upper air-passages, would teach a lesson in aural practice which many medical men have yet to learn. Still more instructive are the casts of the external auditory meatus, which are always viewed with scepticism at first, even by those having con-

siderable knowledge of the ear. The tortuous form natural to the canal as shown in some specimens (Fig. 2), can be largely done away by drawing the auricle up and back (Fig. 3); but the extreme obliquity of the drum-membrane and the widening of the inner third of the canal to form a pocket close beneath it, are anatomical facts too generally unknown. The cases are still numerous where grave injury is done by the surgeon in endeavoring to extract foreign bodies. Without illumination, ignorant of the anatomy, and armed only with improper instruments and a determination not to come out empty-handed, he will plunge in and force the foreign body, if present, through the drum-head; or, if there be no foreign body, will tear away the ossicles as such. Twenty ears have been seriously damaged, by efforts to remove a foreign body, to every one that has suffered from its undisturbed presence. The cast of the normal auditory canal cannot be withdrawn without damage to it or to the canal, as these specimens well illustrate; for thinking the

FIG. 2.

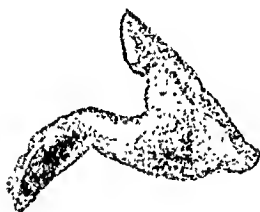


FIG. 3.



casting a failure, I tried to withdraw the readily-movable mass. After many failures, my utmost strength dragged it out (that of the other side broke off in the canal), and the repeated casting gives evidence of much laceration from the violence used. Yet this is in the undeveloped meatus of a child; in the adult either bone or metal would have to break. As the forcible extraction of any other impacted mass is as difficult and dangerous, the often-neglected rule that the syringe is the only safe means for use in such cases receives another clear confirmation.

SOME IMPORTANT POINTS REGARDING THE APPENDIX VERMIFORMIS.

By JOHN FERGUSON, M.A., M.D., L.R.C.P. EDIN., ETC.,
DEMONSTRATOR OF ANATOMY, UNIVERSITY OF TORONTO, AND LECTURER ON NERVOUS DISEASES,
UNIVERSITY OF TORONTO, SUMMER SESSION.

The following observations have been made during the past eight years, and cover a total of two hundred dissections, carefully performed

for the purpose of elucidating certain points regarding this small and apparently unimportant bit of the human body.

The average length of the two hundred appendices was four and one-half inches; and the average diameter that of a No. 9 catheter, English scale. In three cases the appendices were only half an inch in length; while in only one case could it be said that it was entirely absent.

Of the entire two hundred examples, the appendix was supplied with a mesentery of its own, and so placed that its perforation would open directly into the peritoneal cavity, in one hundred and twenty-three. Of these one hundred and twenty-three, the appendix lay to the right of the cæcum in nineteen, descended downward in eleven, lay inward from the cæcum in eighteen, and behind the cæcum in the remaining seventy-five.

The other group of seventy-seven cases was specially interesting in the fact that the appendix was so placed and covered by peritonæum that its perforation would open into the subperitoneal tissue, and establish a diffuse form of cellulitis. In these cases the most likely course for the pus to pursue would be downward, and finally to present itself in the situation of a psoas abscess. One case is of great interest. A man of about forty, who had a discharging sinus in the above situation, died of an acute attack of pneumonia. A soft catheter could be passed up this sinus a distance of ten or eleven inches. On making a careful dissection of the sinus, it was traced to a perforated appendix, that lay behind the peritonæum in the position of the above seventy-seven. In reality this case was an example of a faecal fistula.

Out of the two hundred cases examined there was evidence of old-standing lesions and perforations in seven. In three of these latter the proof, that at some prior date there had been a perforation, was quite positive.

Foreign bodies were found in fifteen of the two hundred. There were enteroliths in two; a small stone in one; a small bone in one; a piece of a screw nail in one, and such articles as orange-pips, cherry-stones, etc., in the other ten.

The above remarks are of some importance in showing that of the two hundred appendices, there were foreign bodies in fifteen; and that there were good signs of lesions in seven; three clearly having been of the character of a perforative appendicitis. This is very important, as pointing to the possibility of recovery after such a lesion of the appendix.

REVIEWS.

THE SCIENCE AND ART OF OBSTETRICS. By THEOPHILUS PARVIN, M.D., LL.D., Professor of Obstetrics and Diseases of Women and Children in Jefferson Medical College, and one of the Obstetricians to the Philadelphia Hospital. Second edition revised and enlarged. Illustrated by two hundred and thirty-nine woodcuts and a colored plate. Philadelphia: Lea Brothers & Co.; 1890.

A SYSTEMATIC treatise on obstetrics, which, alongside of able and worthy competitors for favor, runs through one edition and is succeeded by an elaborate revision in less than three years, requires no comment as a successful book. One of the most characteristic things about the first edition of Dr. Parvin's work was the cordial reception and large sale it received in England. Of course, we have got above caring for such things now, except so far as it may prove that our English-speaking brethren on the other side know and can appreciate a good book.

This edition, as comparison with the former shows, is in many senses of the word a new book. It is largely rewritten, and while the general arrangement is preserved, and the author's opinions, like the convictions of a mature student, but little changed, yet in its new matter it is brought down rigidly to date. As the first edition received extended notice as a whole in these pages, it may serve the reader's purpose to notice the new matter and alterations that characterize this edition.

The chapter on Pelvic Anomalies is entirely new, that on Ectopic Gestation chiefly so. The method of delivering the head in head-last labors may be regarded as new. Among the portions in which careful revision is to be noticed are those relating to the Cæsarean and Porro's operations. Hicks's method of manipulative version is given in full with illustrations of great practical value. A good deal has been changed and much added on Puerperal Septicæmia. Puerperal eclampsia is new in the theory of its origin. In the practical technique of the parturient there are marks of new work as in removal of retained placenta, and retention after delivery.

As some of the new and revised matter relates to what in obstetrics may be regarded as burning questions of the day, it will be worth our time to notice what our author has to say. The one first worthy of extended notice is that on ectopic pregnancy. The opinion of the author that will startle some readers is that 1 in 500 of all pregnancies is the actual proportion of the ectopic form. The author stands alone among observers in this large ratio, although he has evidently been to considerable trouble in collecting his data. Concerning the still vexed question of location Dr. Parvin is among the most positive of authors concerning the rarity of interstitial pregnancies, "as they are more fre-

quent in medical journals than they are in autopsies or in abdominal sections." The author is not an advocate of what he terms the "American method of treatment," that by electricity, and quotes the words of an expert abdominal sectionist, that electricity ought to be restricted to cases refusing abdominal section, or where no one could be found capable of doing the operation. "I think," says the author, "that this is the most that ought now to be said in favor of the treatment by electricity." This certainly excludes the United States, for it may well be doubted if there is any locality known to the author, or to his expert either, where one may not find a man ready to make an abdominal section. But we believe it safe to say that no author or book is yet known to man with authority sufficiently weighty to wipe electricity out as a means of treating a suspected case of ectopic pregnancy of the early weeks. Tait, with the thunders of a surgical pontiff, has tried in vain, with the added weight of the abdominal sectionists of two hemispheres. Herbert Spencer says, that when a belief shows this power of survival there exists about it certain elements of truth. The trouble is that the surgeon can afford to be positive while the electrician cannot, but what he lacks in the way of demonstration he more than makes up in the force of his self-conviction.

The illustrations in that portion that is mainly new in the head-last delivery are of a higher character, and aid the text in a most efficient way. In contrasting two methods of delivery, that of the Wigand-Martin-Winckel method (pressure upon the after-coming head from above) and that of the Veit-Smellic (manual extraction), the author states after Eisenhart that the number of children living and of children that continued to live is seven times greater by the former than the latter, a statement which, if correct, ought to settle the method for all time.

The chapter on Cæsarean Section and its substitutes is one of the rewritten sections. We fear the hardest task the author attempts in the book is to clear up the confused terms designating the various operations made through the abdominal wall. We all know that the prefix *laparo* does not, in its etymological sense, mean an incision in the middle line, yet it has been in common use since 1811 by Fieldler, "who took it upon himself," as Dr. Harris says, "to extend the word over the whole abdomen." The author applies the term *gastro-hysterotomy* to the Cæsarean section, and *gastro-hysterectomy* for amputation of the organ as in Porro's operation. Dr. Parvin, like many other writers, believes that the method of uterine suturing explains the modern success of the Cæsarean operation. When Säger first made a resection of the edges of the uterine incision it appeared as though there was a radical departure from the old method and that the improvement in results was a natural outcome. But the technique has reverted back to the old form, and the results are as good, if not better. The present deep and superficial sutures are "the great merit of Säger's improvement," as the author says: but are not Säger's any more than they belong to this humble reviewer. Who first put in deep sutures and then closed any intervening gaps with superficial ones, no man knows, but he lived generations before Säger was born, and before German surgeons had made the whole field of surgery a directory of proper names. To our mind "the great improvement in the Cæsarean operation, an improvement which has given the operation in recent years a marvellous success," is

not a mere matter of sutures, but because the operation is made by men skilled in gastrotomy and in clean surgery, and upon women not yet *in articulo mortis*. "If a choice of time can be made," says the author, "it is preferable to do the operation about the end of pregnancy, but before labor begins." What systematic author would have dared to write this even so recently as ten years ago? Yet this is what success has led to, and, also, this is what has led to success.

For this reason the operation of Porro, after the novelty had worn off, found itself replaced by its older rival, against which the charge could no longer be brought of a nearly total mortality. The Italian operation then found its natural field of usefulness. In the instances of a uterus damaged by traumatism, fibroma, or the complication of incoercible hæmorrhage, it largely serves to save life as an alternative in Cæsarean section. There does not appear any reason to doubt that Dr. Parvin has the mass of operators with him in this opinion of the two operations. The extreme dogma of Tait that Porro's operation "will revolutionize the obstetric art, and in two years we shall hear no more of craniotomy and evisceration," has produced no impression on the general mind, which, fortunately for humanity, is one of conservatism. The modification of Müller is the form the operation is done in, and, like the modern Cæsarean, the improvement is in the direction of simplicity.

Braxton Hicks's method in version is given with several well-executed cuts which give a very practical idea of the method. Compared with other recent works on obstetrics this section is the most complete of any, and for the first time in an American text-book this important manipulation is given the place it deserves. Considering the fact that Braxton Hicks's first article appeared thirty years ago, it was high time that it received the complete and practical illustration that it has in Dr. Parvin's second edition.

Puerperal septicæmia has been further elaborated, compared to the first edition, and a good deal changed in wording and arrangement.

The theory of eclampsia advanced by the author is new as to the theory of its origin, and appears capable of giving a reasonable explanation of the phenomenon. This theory is briefly expressed and is deserving of quotation: "The disease should be regarded as essentially a toxæmia, the poison resulting from a failure of one or more eliminating organs to exercise perfectly their function. By the light of this theory, possibly, we may see why in case of the death of the fœtus, if the eclamptic attacks occur in pregnancy, they cease, or if albuminuria has occurred it lessens or disappears. While the fœtus lived it was constantly throwing into the mother's blood materials which ought to be eliminated through her emunctories. But if the fœtus dies, this process no longer goes on, the mother has only to eliminate self-created poisons, and the organs concerned are adequate to this single work, though they failed when the double burden was cast upon them." As the albuminuric theory will not explain the condition even within the most ordinary experience, and the neurotic theory, although more difficult to reason down, also fails, the explanation of a toxæmia certainly makes clear some of the more obscure features of the disease.

It is not often in the notice of a second edition that so much can be said of the new matter that an author has laboriously added or re-written. The value of the work has certainly been increased, while its handy and compact form has in no way been impaired. E. v. DE W.

PROGRESSIVE EXERCISES IN PRACTICAL CHEMISTRY. By HENRY LEFFMANN; M.D., Ph.D., etc., and WILLIAM BEAM, M.A., etc. Philadelphia: P. Blakiston, Son & Co., 1890.

THIS little book is offered by its authors as a laboratory guide in inorganic chemistry, presumably for the use of medical students and in medical colleges. They state in the preface that "the usual method of laboratory instruction, consisting of practice in elementary qualitative analysis, does not seem to us adapted to the teaching of chemistry as contemplated in the curriculum of American medical colleges." To us their effort, offered here as an improvement or substitute, appears, however, entirely too elementary, and suitable only for teaching chemistry in high schools and general colleges.

It is to be hoped that, in the near future, elementary chemistry will be considered as a requisite feature of a student's store of knowledge on entering medical colleges, and that the *application of chemistry to medicine only* shall have to be taught to them, embracing the qualitative and quantitative analysis required by such a course.

We cannot fail, however, to praise the excellence of this little work for its practical, systematic, and lucid manner of arrangement, together with the many new experiments and apparatus added by its authors, notwithstanding that we are at variance with them as to its sphere of usefulness and the course of chemistry to be taught at medical schools.

L. W.

ESSENTIALS OF MINOR SURGERY, BANDAGING, AND VENEREAL DISEASES. By EDWARD MARTIN, A.M., M.D. Philadelphia: W. B. Saunders, 1890.

THIS compend is a good addenda to the same author's work on *Essentials of Surgery*. It gives the most frequently used bandages (illustrated), as made by the roller, handkerchief, plaster-of-Paris, and adhesive plasters; the more important knots and sutures (illustrated); the manner of using, and the proportions of the ordinary antiseptics. It gives good methods of preparing sponges, catgut, silk, dressing, and drainage, together with an excellent description of the proper preparations for an aseptic operation from its commencement to its termination. The portion devoted to the administration of anæsthetics is well illustrated and thoroughly practical. The uses and the methods of application of counter-irritants are explained, as well as the proper methods of hypodermic injections. The more important fracture-dressings are described with proper illustrations, as well as the most common luxations.

The portion devoted to venereal diseases comprises a short explanation of the technicalities, together with a statement of the methods of treatment of the three great divisions and their sequelæ.

With this outline the work is a great help to the busy student preparing for examination, and fully carries out its title.

A. H.

PROGRESS OF MEDICAL SCIENCE.

THERAPEÛTICS.

UNDER THE CHARGE OF
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ANTISEPSIS OF THE INTESTINES.

CANTANI writes that there are two therapeutical reasons for the disinfection of the intestines: first, to destroy the injurious microorganisms, and secondly to destroy the ptomaines already produced by them.

Except in very rare cases, the destruction of the pathogenetic micrococci in the living body will never be realized. All that is required at present is to produce an unfavorable soil for the growth of the micrococci, so that their rapid reproduction may be checked or diminished.

The destruction of the living disease-germs in the intestines may be accomplished per os or per anum. Antiseptics may only be given by the mouth when they are not changed or absorbed by the stomach or upper part of the small intestine, so that they reach the ileum unchanged, which is almost always the seat of the disorder.

For this purpose doses of calomel have been used, but set aside as impractical except in infections of milder form. Bouchard has recommended large doses (*ad* 100 gm. daily) of finely-powdered carbon, naphthalin, finely-powdered iodoform (*ad* 1 gm. daily), and bismuthi salicylatis.

These substances, given in sufficient amount, can effect an antiseptic action on the fæces, but not, since they are insoluble, on the walls of the intestines. A marked action on the typhoid processes by these drugs has not yet been fully demonstrated.

Disinfecting fluids like carbolic acid and corrosive sublimate, given per os, can never produce complete disinfection of the intestines. Even overlooking their poisonous effect on the system, they will never carry out their antiseptic purpose, because a part is already absorbed by the stomach and the remainder loses its antiseptic qualities before reaching its destination.

The only way left is per anum, which is also the shortest way to the intes-

tines. This is the best way to apply antiseptic fluids which are intended to come in direct contact with disease-germs.

That the fluid injected is carried to the upper part of the duodenum is proved by injecting fluids which are not well borne by the stomach and which were vomited.

Since it has been proved that the injected fluid can be carried up to the higher loops of the intestine by means of a tube hanging from a reservoir two to four yards above the level of the patient, there can be no doubt of the advantages of this method of treatment.

Moreover, the injected fluid causes no irritation, which may be produced by every insoluble substance; besides there is no chemical or mechanical action on the stomach, neither are its functions disturbed. The fluid is brought into the intestines directly without being absorbed or changed at all.

In addition to the antiseptic action of these fluids we must not overlook others which are also valuable. By injecting a very cold fluid fever temperatures may be considerably lowered. In cases like cholera, accompanied by loss of heat, the temperature may be raised by injecting hot fluid, and vitality relatively restored. In this way the intestines are cleaned out and a large number of bacteria and ptomaines are ejected with the outflowing fluid. By this method the blood is diluted by absorption, which would not be possible to such a degree per os and thereby the excrements are eliminated with greater ease. The injected fluid thus becomes a true medium for washing out the entire system.

For antiseptics of the intestine all substances soluble in oil and water may be used, the same applies to astringent preparations, such as: Alum, salicylic preparations, thymol, aseptol, zincum sulphophenicum, boracic acid, hydrochloric acid, sulphite, and hyposulphite.

Cantani recommends gallic acid and carbolic acid. Gallic acid has been successful in cases of intestinal catarrh with diarrhoea, also in true specific dysentery and typhoid fever. In cases of dysentery it may be desirable to add gum arabic to the acid or pure oil, on account of the painful condition of irritation. In the beginning of typhoid fever Cantani has prevented further development of the disease especially by using carbolic acid, 2 per cent. solution, with the addition of quinine hydrochloras.

In advanced stages of enteric enfeeblement, when the injected fluid will not rise, we are obliged to resort to the mouth as a means of reaching the duodenum, in which case naphthalin is to be preferred.—*Centralblatt f. d. gesammte Therapie*, Heft 9, 1890.

THERAPEUTIC ACTION OF EUPHORINE.

Euphorine is the name for phenylurethan given by PROF. GIACOSA, of which the chemical formula is $\text{CO} \begin{matrix} \text{OC}_2\text{H}_5 \\ \text{NH}(\text{C}_6\text{H}_5) \end{matrix}$.

This combination is produced by the action of chlorocarbonic ether upon anilin. It is a white, crystalline powder, with slight aromatic odor and a taste at first hardly noticeable which afterward becomes sharper, resembling cloves.

According to Dr. L. Sansoni, euphorine is slightly soluble in cold water, very soluble in alcohol and in mixtures of water and alcohol, such as white

wine. Small doses of euphorine are well borne by men and the higher animals. A drachm and a quarter injected into the stomach of a rabbit produced death in five hours, the animal having collapse, gradually-diminishing temperature, increasing weakness, and anæsthesia.

Euphorine has been used in various diseases, and has proved itself to be a remarkable antithermic, antiseptic, antirheumatic, and, in some cases, an analgesic remedy.

1. Antithermic action :

Euphorine is indicated in certain acute and chronic febrile diseases, such as typhoid, croupous pneumonia, tuberculosis of the lungs, acute rheumatic fever, orchitis, influenza, exudative pleurisy.

The temperature falls rapidly after the administration of the drug from one-half to one hour. The action of the drug is maintained from five to seven hours.

Strictly speaking, collapse has never been observed, even in cases in which the temperature sank below normal; only a collapse-temperature was observed, which condition is common to all antipyretics.

The antithermic action is not always constant, the same dose having different actions in different individuals. It is advisable to begin with small doses to test the tolerance of the patient.

Generally, in febrile disorders, 15 to 20 grains p. d. may be taken without unpleasant results. $7\frac{1}{2}$ grains euphorine are equivalent to 15 grains antipyrine. It is advisable never to begin with a larger dose than $1\frac{1}{2}$ grains.

2. Antirheumatic action :

It has been tried in acute and chronic rheumatism. The single dose must be higher in chronic cases than when given to reduce the temperature; the daily dose is from 20 to 30 grains, better in large single doses than in repeated small doses.

In acute rheumatism one has observed the diminution of pain—the spontaneous as well as that produced by movement or pressure. The cases of chronic rheumatism with which he experimented were those which had resisted other specific remedies. After giving euphorine there was a slight diminution of pain and a little more freedom of motion.

3. Analgesic action :

It has been tried in tabes dorsalis, neuralgia, orchitis, hemicrania, as an analgesic, with varying success. The dose must be 20 to 30 grains, or more, during twenty-four hours.

4. Prof. Giacosa has proved its antiseptic power. He has used it with remarkable results dusted over indolent ulcers and in chronic ophthalmia. In a few days a wound is improved in appearance, the surface becomes red, pus disappears, and granulation proceeds rapidly. Such a sure and quick action, accompanied only by a slight temporary pain, is the chief advantage of this new remedy.—*Therapeutische Monatshefte*, Heft 9, 1890.

ON THE TREATMENT OF DIARRHOEA WITH LACTIC ACID.

After continued experiments, DR. HAYEM has found that lactic acid is well borne by the alimentary canal.

After large doses it appears in rather a short time in the urine and fæces,

and thus proves that the acid given in a sufficiently large amount reaches the intestines unchanged and may act directly upon them.

Hayem has never observed digestive disturbances (flatulence, emesis, or diarrhœa) after daily doses of $2\frac{1}{2}$ to $3\frac{1}{4}$ drachms.

He prescribes the remedy in the form of lemonade, as follows:

R.—Acidi lactici	10.0 to 15.0.
Aquæ destill.	800.0.
Syrup. simpl.	200.0.

Sig.—Take during twenty-four hours half a tumblerful between meals.

With this he had in almost all cases of diarrhœa excellent results. In tuberculosis accompanied by digestive disturbances he added daily one or two bottles of kefir (koumis). Also in diarrhœa of typhoid and in cholera nostras it proved successful. Otherwise lactic acid may be prescribed in cholera Asiatica. With reference to prophylaxis it may be given in doses of a drachm to a drachm and a half daily; otherwise, doses of $2\frac{1}{2}$ to 5 drachms should be given, as early as possible, in twenty-four hours.—*Therapeutische Monatshefte*, Heft 9, 1890.

TRACHEAL INJECTIONS AS A WAY OF ADMINISTERING REMEDIES.

In view of the possibility of the advantages which the trachea may offer to the introduction of remedies for the treatment of respiratory diseases, it is worth while to note the report of M. Botey before the Académie des Sciences. The trachea is not popularly supposed to be willing to tolerate quietly the introduction of foreign liquids, but it has been shown that if the larynx be first anæsthetized with a ten-per-cent. cocaine solution, that, by means of a suitable syringe, water and solutions of various drugs may be introduced without exciting unpleasant symptoms. M. Botey injected two and a half drachms and, after eight days, about an ounce of distilled water into his own trachea without causing discomfort or coughing. His respirations were increased from seventeen to twenty-one, and his pulse from seventy-four to eighty-two. In a woman who had syphilis affecting the larynx and trachea, three drachms of a one-per-cent. solution of iodide of potassium were injected, and after a few days six drachms of this solution, containing also one-twenty-fifth of a grain of bichloride of mercury, were given in this way on every other day. These injections were repeated seventeen times successively. The treatment was well borne, and the patient made a good recovery. The only phenomena which were observed after these injections were a diminution in the number of respirations from twenty-three to eighteen per minute during several hours.—*Le Mercredi Médical*, No. 30, 1890.

SALIPYRIN.

Salipyrin is a chemical compound of antipyrine 57.7 per cent. and salicylic acid 43.3 per cent.; it is a white crystalline powder, without odor, dissolves in alcohol, but only to the extent of one-half of one per cent. in water.

It goes without saying that it is another antipyretic, and may be used in amounts up to ninety grains, beginning with thirty grains and following this

at intervals of an hour each with fifteen grains. The temperature rises again after four or five hours, and is unaccompanied by a chill.

In acute rheumatism it has been found to reduce the pain and swelling, and it is of service, also, in chronic rheumatism.

Salipyrin is said not to have disagreeable accompaniments; ninety grains daily have been taken by some patients for one or two weeks. In one case there was an eruption, which disappeared in three or four days.

At present it is too expensive a remedy to be in much demand.—*Berliner klinische Wochenschrift*, No. 37, 1890.

RESORCIN IN DIPHTHERIA.

ANDEER has recently collected evidence in regard to the usefulness of resorcin as an antiseptic, and especially with reference to its employment in diphtheria.

Recent investigations have shown that this drug is a very active antiseptic, and harmless even in solutions containing ten per cent. of it. A ten-per-cent. solution in glycerin penetrates the tissues rapidly. At the St. Lazare Hospital it has proved serviceable in diphtheria.

It should be used every one or two hours, day and night, locally to the diseased spot. A spray of a five-per-cent. solution should be kept up in the patient's room, and, further, two to four teaspoonfuls of a two-per-cent. solution of resorcin in syr. terebinth. should be administered daily.

In diphtheria of the larynx resorcin is of little value.—*Centralblatt f. d. gesammte Therapie*, Heft 9, 1890.

AMYLHYDRATE.

The dose of this liquid is about a drachm, but it is not very soluble in water. A small teaspoonful may be given in a glass of beer, or the following may be used :

R.—Amylhydrate	.	.	.	.	.	.	.	3ij.
Aq. destill.	}	.	.	.	.	.	.	āā 3ij.
Aq. flor. aurant.								
Syr. cort. aurant.	.	.	.	.	.	.	.	3j.—M.

Sig.—One-half at night.

—*Correspondenzblatt f. Schweizer Aerzte*, No. 18, 1890.

TREATMENT OF DIPHTHERIA.

To prevent the spread of the diphtheritic process, which may be better accomplished if we begin sufficiently early, local disinfection is the chief indication. With this end in view, DR. WOLF, of Freiburg, has used the volatile oils, a class of remedies which he considers well adapted to this purpose, since Ziegler has shown that oil of peppermint, in the proportion of 1 to 300,000, prevents the growth of bacteria.

Menthol rubbed with sugar, in the proportion of 1 : 20 of sugar, or 1 : 10, may be applied by means of a brush to the site of the local inflammation, and is more efficacious in removing the membrane than menthol in solution.

The powder should be applied three or four times a day; on the second or at the latest on the third day the membrane disappears, and a clean, sharply-defined, depressed ulceration remains which heals rapidly under continued local use of the powder.

This treatment is not novel, but Dr. Wolf has employed it successfully for two years.—*Therapeutische Monatshefte*, Heft 9, 1890.

IODINE FOR VOMITING.

Iodine is useful to relieve the vomiting of pregnancy and also other forms of this distressing symptom, including that accompanying alcoholic gastritis. Ten drops of the tincture in four ounces of water, one-third of this after each meal, is the usual dose. It sometimes causes a pleasant sensation of warmth in the stomach which may last twenty or twenty-five minutes.—*Correspondenzblatt f. Schweizer Aerzte*, No. 18, 1890.

SOLUTION OF IODOFORM IN OLIVE OIL.

According to experiments made in Professor Binz's laboratory, olive oil will dissolve from two and one-half to three per cent. of iodoform.—*Therapeutische Monatshefte*, Heft 9, 1890.

SALT FOR STINGS.

The pain and swelling following the stings of bees, wasps, and gnats may be relieved by rubbing-in salt moistened with water. The application should be repeated several times.—*Therapeutische Monatshefte*, Heft 9, 1890.

A CASE OF ACUTE POISONING FROM ANTIPYRINE.

The following case may serve well as a warning to practitioners who are in the habit of regarding antipyrine as a perfectly harmless remedy. A lady, twenty-two years old, took fifteen grains of antipyrine after her midday meal, and in about three minutes she complained of a peculiar pain in the back of the head. A few minutes later she had ringing in the ears and dizziness; this was followed by palpitation, dyspnoea, cold perspiration on the face, a sensation of warmth in the whole right side of the body and of cold in the whole of the left side. Disturbance of vision followed after about twenty minutes, and amaurosis, which continued half an hour and then slowly disappeared. Hyperæmia of the optic nerve and marked congestion of the conjunctiva were observed. There was cyanosis about the lips, the pulse was two hundred per minute, the respiration was rapid and labored, and speech was difficult.

After about an hour and a half there appeared, on the right side only, an exanthematous eruption; after a few hours there was severe vomiting.

The patient's condition improved gradually during the afternoon and evening, and no serious results followed.

She was given, apparently with good results, a grain and a half of caffeine every three hours.—*Centralblatt f. d. gesammte Therapie*, Heft 9, 1890.

CARBOLIZED OIL EXTERNALLY.

DR. TRESILIAN has advised the use of carbolized oil in scabies (1 part carbolic acid to 15 parts olive oil). He asserts that it removes itching instantly without producing inflammation of the skin.

Even if it were possible to relieve the pain or to produce cure, Dr. Israel would still oppose its use on account of the possibility of general carbolic poisoning.

At the end of the year 1860, when the poisonous effects of this remedy were not sufficiently well known, it was much employed as an ointment in skin diseases. Different authorities reported cases of toxic symptoms, such as dizziness, dyspnœa, nausea, loss of consciousness, several minutes after its use; even death has occurred. The following cases will illustrate: Machin, in 1868, has reported two cases in which, after anointing the body with warm carbolic acid, death occurred in $2\frac{1}{2}$ hours in a woman of sixty years, and in 60 hours in a girl twenty-one years old.

In recent times Lubrecht reported a case of a man, twenty-one years old, with scabies, who was rubbed with a solution of one ounce of carbolic acid in ten ounces of water. Five minutes after its use dizziness, pallor, and death occurred after two gasping respirations.

Finally, Koehler has seen death occur in a young man after previous symptoms of poisoning, for whom was prescribed the fifth part of a solution of 1 : 8. In the last case Hoppe-Seyler found carbolic acid in the blood. These cases are sufficient to show the rapid absorption and poisonous action of carbolic acid even in external applications. On this account one should avoid using carbolic acid in such a disease when there are other better and safer remedies in the field.—*Therapeutische Monatshefte*, Heft 9, 1890.

MEDICINE

UNDER THE CHARGE OF

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THE RECOGNITION OF THE GONOCOCCUS.

STEINSCHNEIDER (*Centralbl. f. d. med. Wissensch.*, 1890, No. 39, 710) maintains, in opposition to a statement of Fürbringer's, that the application of the Gram method of staining microorganisms is necessary to the satisfactory study of the gonococcus, inasmuch as the only positive characteristic of this coccus is that it is not stained by this method, while nearly all other diplococci found in the urethra are colored thereby.

These conclusions, which agree with those of Roux, are the result of the examination of eighty-six patients with acute and chronic gonorrhœa. The

almost entire certainty of this test is rendered absolute by the observation of the further characteristic of the gonococci, namely, that they are found within the pus-cell.

THE CONTAGIOUSNESS OF LEPROA.

In the effort to throw further light on this subject, WESENER (*Centralbl. f. d. med. Wissensch.*, 1890, No. 39, 715) practised the introduction into the anterior chamber of the eyes of rabbits of small portions of leprous tissue, which had been kept for two and a half years in alcohol, and in which the bacilli were, beyond question, dead. An inflammatory reaction was brought about and the implanted piece entirely or partly absorbed. The bacilli, which retained their form and colorability, were taken up by cells, which did not remain only in the immediate neighborhood, but were even found in the region of the iris, ciliary body, and space of Fontana.

Since, now, the changes which take place on the introduction of living leprous tissue into the same locality are histologically and bacteriologically identical with those described as occurring after dead bacilli have been employed; and since the histological alterations are very similar to those seen after the introduction of finely-divided foreign bodies or dead tubercle bacilli, the author concludes that all experiments of this sort which have been claimed to prove the contagiousness of leprosy have been in reality of negative value.

TWO CASES OF FRIEDREICH'S ATAXIA.

C. H. BROWN (*Journ. Nerv. and Ment. Dis.*, 1890, No. 10) reports two cases of Friedreich's ataxia. In the first, a woman twenty-nine years of age at the time of reporting, there was a distinctly neurotic family history, though without direct inheritance or instance of the occurrence of the affection in her brothers or sisters. At the age of thirteen she had attacks of supposed malaria, and developed round shoulders and ungraceful movements and double lateral curvature. From the age of fifteen there were frequent attacks of headache, backache, and erratic pains in the extremities; the ungracefulness increased, falls became frequent, and ataxia rapidly developed. There had been profuse menstruation, flushings of the face, irregular action of the heart, polyuria, cold hands and feet, with chilblains in winter; attacks of pulsation in the groin and vulva.

Examination showed no mental derangement; ataxia of the lower extremities, rendering standing alone impossible; ataxia of the upper extremities and of the muscles of the face; ataxia of speech, rendering it slurring and rapid, with omission of labials. Tactile sense and temperature were good; weight-sense impaired; reflexes abolished. Ophthalmoscopic and electrical examinations negative; no evident paresis.

The second case, occurring in a woman aged twenty-eight years, has already been reported by Dana in 1887. When reexamined in 1889 she was well nourished; could take a few steps when assisted. The limbs were not stiff; there were both ankle-clonus and tendon-reflex. The temperature-sense was good; the tactile sense a little affected; the muscle-sense poor, both in the

lower and upper extremities; in the latter no reflexes could be obtained, and there was marked muscular weakness. The speech was slow but not ataxic. The electrical and ophthalmoscopic examinations were negative. There was no spinal curvature. In the earlier and more active stage of the disease in the history of this patient there had been decidedly spastic symptoms.

The author gives a very interesting discussion of the symptoms observed, and of the views of different writers with regard to the nature and cause of the affection.

CONTRIBUTION TO THE STUDY AND HISTORY OF WEIL'S DISEASE.

WEISS (*Centralbl. f. klin. Med.*, 1890, No. 38, 688) defines this disease as a suddenly-developing, acute, febrile affection, arising without discernible cause, accompanied by icterus, swelling of the liver and spleen, and renal and severe nervous symptoms, and running a short and favorable course. He reviews the cases which have been already reported, many of which he feels obliged to consider as not genuine examples of the disorder. He then, reports a number of cases recently treated by him, as well as a large number of others which came under his observation in a small epidemic in 1866, and which he published under the title of "Infectious Icterus" before Weil's observations were made. As French authors also described it before Weil, he suggests that it be designated "*Typhus biliosus nostras*."

The symptoms are of two classes—pathognomonic and accidental. To the first belong the sudden development of high fever, usually with chilliness or rigor; cerebral symptoms and muscular pains; disturbances of the digestive apparatus; icterus and swelling of the liver from biliary congestion; enlargement of the spleen; renal symptoms. To the second class belong cutaneous eruptions, as roseola, erythema, purpura, petechiæ, herpes labialis or nasalis, epistaxis, bronchitic symptoms.

Males are much more frequently affected, and usually between the ages of fifteen and thirty years. Most cases occur during the summer. The hygienic and sanitary conditions of places in which the disease has occurred have been recognized by all observers as bad. No positive case of direct transmission of the disease has as yet been observed.

As exciting causes there have been mentioned errors in diet, exposure to cold, over-exertion, ingestion of bad beer; but the true etiology of the disease has not yet been discovered, and the investigation of the blood for bacteria, carried out by some writers, has had but negative results. Though the affection has ended fatally, yet the prognosis is usually favorable. The recovery, however, is tedious. The severity depends upon the degree of the renal involvement.

THE AMCEBA COLI IN DYSENTERY.

LAFLEUR (*Johns-Hopkins Hosp. Bull.*, 1890, No. 7, 91) reports a case of dysentery in which the amœba coli were found in the stools. The patient, a man of twenty-seven years of age, a seaman, had been in the tropics for a short time in 1880, but not since. While at sea, two weeks before coming under observation, he had slight epistaxis, vomiting, and diarrhœa, and after a week numerous bloody stools, with tenesmus and abdominal pain. On

admission to the hospital his stools were greenish-brown, watery, fœtid, and contained blood, mucus, shreddy detritus, and scattered masses of pus. Numerous amœbæ were found actively moving in the stools. They varied considerably in size, the average being five to seven times that of a leucocyte. They were pale bluish-green in color, and contained one to many small vacuoles surrounded by highly-refracting granular particles, the whole being invested by a homogeneous outer zone looking like finely-ground glass. In some it was possible to make out a circular nucleus. Several stools were examined every day, and amœbæ always discovered. Small grayish-yellow pus collections, which could be easily picked out with the forceps from the fluid part of the stools, exhibited the organisms to the best advantage. This is the second case of dysentery reported in this country in which the amœbæ have been found.

THE VALUE OF THE PHENYLHYDRACIN TEST FOR SUGAR.

HIRSCHL (*Centralbl. f. d. med. Wissensch.*, 1890, No. 38, 691), in investigating the value of this test for sugar in the urine, found that out of forty-five different specimens of urine only four exhibited the characteristic yellow needles of phenylglucosazone, with a melting-point of 205° C., and that in these four urines the fermentation-test also gave a positive result. The other urines gave only the yellowish-brown masses, strongly refractive globules, and irregular thorn-apple forms of a melting-point of about 150° C., while the fermentation-test was negative. He therefore considers the phenylhydracin test reliable for sugar in the urine. Ten c.cm. of the urine should be mixed with twice as much of the reagent as will lie upon the point of a knife and with three times this unit of acetate of soda. This mixture should then be heated at least an hour on a water-bath, allowed to stand over-night, and the sediment examined microscopically. Levulose gives, it is true, the same osazone as grape-sugar. If, therefore, a polariscopic examination of the urine shows no deviation of the light to the right, the presence of levulose in the urine may be assumed. The combination of phenylhydracin with lactose produces bright-yellow needles ten times as wide as phenylglucosazone, while maltose produces an osazone in the form of broad, yellow plates of a melting-point of 82° C.

THE CAUSES AND TREATMENT OF CHRONIC CONSTIPATION.

KOGERER (*Wien. klin. Wochenschr.*, 1890, No. 33, 638) says that, though a person whose bowels are regular will have one or two, or, rarely, even three, passages daily, it is possible for an individual to suffer from chronic constipation and yet to have the bowels moved as frequently as this. In these cases the passages are only the overflow, while the greatest portion of the fæcal mass remains in the large intestine. It is to be borne in mind that such persons may even suffer from chronic diarrhœa.

In discussing the numerous causes of constipation, the author mentions as one of the chief the voluntary neglect of the natural inclination to stool. Among other causes are an insufficient ingestion of fluid; the loss from the economy of large amounts of water, as in profuse sweating, etc.; an insufficient secretion of the digestive juices, especially bile; the ingestion of certain drugs;

diseases of the brain and cord; hysteria, hypochondriasis, melancholia, neurasthenia, etc.; the occurrence of severe diseases; chronic intestinal catarrh; venous congestion in diseases of the heart, lungs, and liver; atrophy of the muscle of the large intestine, either primary or as a result of general cachexia; sedentary occupation. In general it can be said that conditions of irritation in the intestinal canal are accompanied by diarrhœa, and conditions of paralysis exhibit constipation. The external sphincter offers an exception to this, since, when there is abnormal irritability here, it prevents the fecal matter from passing, while if it is paralyzed incontinence of feces is liable to result. A spasmodic condition of this sphincter may, as is well known, occur in case of fissure. It may also be seen in diseases of the spinal cord involving the centre for the emptying of the large intestine, and it is possible for a similar condition to be due to cerebral affections or general neuroses. The author reports a case in which spasm of the external sphincter, with resulting obstinate constipation, was due to hysteria.

The evil results which may follow chronic constipation are legion. It is important, therefore, that the affection receive fuller attention than it has done. The diagnosis is by no means always easy; and the author relates two interesting cases, in one of which an abdominal section was performed, while in the other the diagnosis of carcinoma was made—both of them proving to be instances of chronic constipation merely. A rational therapy consists in discovering the cause of the condition, where possible, and in fulfilling the *indicatio morbi* by rendering the atonic intestinal muscle again capable of action by increasing the strength of the accessory muscles, as those of the abdominal walls, and by removing any spasmodic condition of the sphincter. A symptomatic treatment is only to be employed when neither of these ends can be attained. Atony of the muscle of the intestine or of the abdominal walls should be treated by massage, exercise, electricity, and hydrotherapy. The electrical current can best be applied by placing the anode in the rectum or on the lumbar spine and the kathode on the abdominal walls, or both electrodes in the latter position. Hydrotherapy for this affection consists in the rubbing of the abdomen with cold water, the use of cold douches, short cold sitz-baths, wet abdominal bandaging, and cold injections. The diet should be carefully regulated, so as to increase the amount of fluid ingested. The use of laxative mineral waters is not to be recommended, since the benefit obtained from them is only temporary. Spasmodic conditions of the sphincter can best be treated by a "rectal cooler" (Artzberger's), which acts both mechanically and thermically.

CARDIO-VASCULAR VERTIGO.

GRASSET (*Memorabilien*, 1890, 9, 539, from *Sem. Méd.*) says that this form of vertigo, which he distinguishes from other forms under the name of cardio-vascular, commonly occurs associated with the symptoms of cerebral thrombosis. It is a symptom of temporary disturbance of the circulation in the vessels of the brain. It is commonly one of the first symptoms of commencing arterio-sclerosis. This form of vertigo is common, since that seen in gout and rheumatism, and as a result of chronic intoxication with tobacco, alcohol, etc., is nothing other than the vertigo of arterio-sclerosis.

The early appearance of the symptom is of great importance, since it permits of the employment of suitable prophylactic measures, directed against a development of arterio-sclerosis in the different viscera, which would result in softening in the brain, sclerosis of the cord, the characteristic involvement of the heart and kidneys, etc.

Cardio-vascular vertigo is generally a chronic affection, lasting for years with more or less well-marked exacerbations arising without evident cause.

At times it is associated with other transitory symptoms, such as hemiparesis, amnesia, fatigue, aphasia. As regards the differential diagnosis, it is to be borne in mind that in general the different varieties of vertigo exhibit no clinical difference. The diagnosis rests upon the nature of the concomitant symptoms. Thus the coexistence of dyspeptic disturbances points toward gastric vertigo; optic or auditory affections toward the corresponding variety of vertigo, while the diagnosis of cardio-vascular vertigo may be made, when besides the physical and functional symptoms, there exist a sensation of pressure, dyspnoea on exertion, palpitation, præcordial anxiety, circumscribed coldness of different parts of the body, headache, insomnia, atony of the radial and temporal vessels, etc. The most characteristic symptom is always the accentuation of the aortic second sound.

The treatment of cardio-vascular vertigo consists principally in diminishing the tension of the vessel-walls; and for this purpose iodide of sodium and nitro-glycerin are indicated. The first, in doses of 15 grains daily, must be continuously administered during months before discarded as useless. The second, in doses of 4 drops of a 1 per cent. solution twice daily, is very valuable for diminishing the blood-pressure. The two drugs may be given together, or the iodide may be administered during the first 20 days of the month, and the nitro-glycerin during the last 10. It is especially important, too, that a strict hygiene be prescribed. Above all, the employment is to be forbidden of all those things which favor the development of arterio-sclerosis, such as tobacco, alcohol, solid flesh, etc. The patient should practise bodily exercise, live much in the open air, and consume milk, tender flesh, and leguminous vegetables. If epileptiform attacks accompany the vertigo, bromide of soda also should be given in doses of two to three grains daily. In cases where there is loss of strength arsenite of sodium is of value.

VERTIGO OF BULBAR ORIGIN.

BUZZARD (*Lancet*, June 25, 1890) admits the existence of Ménière's disease, but thinks that it is the too common habit to attribute to an affection of the labyrinth all cases in which there is paroxysmal vertigo accompanied by deafness and ringing in the ears. The author's belief has long been that in perhaps the majority of these cases it is through the centre in the medulla oblongata that the nerve is affected, and not at its periphery. Of the ten cases published by Ménière, an autopsy was made in only one, and there are but very few other cases in which the diagnosis was confirmed by autopsy.

The author relates an interesting case of a physician, forty-three years of age, who was suddenly attacked on waking with giddiness without deafness or tinnitus. While the head was perfectly still he was free from the trouble, but with the slightest turn it came on again. After some weeks he recovered, but

was again after a time attacked with faintness, lasting a couple of hours and accompanied by profuse sweating, and a similar attack occurred on the next day. In these attacks he did not lose consciousness, but felt as if his heart was not acting, and was unable to lower the head to the right—as in looking up at something to the left above him—without giddiness, though he was able to move it rapidly from side to side, or to stoop down. Immediately after the attack he passed a large quantity of colorless urine.

The character of the vertigo in this case was distinctly auditory, the faintness was probably due to inhibition of the heart's action through the vagus, and the profuse sweating and large discharge of urine to irritation of centres in the medulla. Thus the legitimate inference seems to be that the nucleus of the vagus, the auditory nucleus, and the vaso-motor centre in the bulb, were all subject to some irritating influence.

There is reason to believe that irritation exerted in this region would produce just such disturbance of functions. Irritation applied to any part of the fifth nerve, even to the nucleus in the medulla, gives rise to pain, referred, according to the law of peripheral perception, to the periphery; and it is just as reasonable that irritation applied to the fibres or to the nucleus of the auditory nerve—a nerve of special sense—will give rise to perturbed action in the organs supplied by that nerve—vertigo if the part supplying the semicircular canals be affected; tinnitus, if the part going to the cochlear portion. It has been found, in fact, as regards another of the bulbar nerves, that in every case of tabes with gastric or laryngeal crises, and in which the medulla has been examined, there exists sclerosis in the neighborhood of the vagal nuclei.

Buzzard then reports several other interesting cases bearing upon the subject in question. In one of these, which appeared to have all the symptoms of Ménière's disease, the patient was nearly "stone-deaf" during the attacks. It is clear that this paroxysmal deafness could not be due to organic disease of the internal ear.

Cases of the kind described are very numerous. In such cases sometimes one nerve-centre and sometimes another seems to bear the brunt of the transient influence exerted upon the bulb. In some instances there are violent attacks of vertigo with auditory symptoms, while in others there may be an attack of irregularity of the heart's action, comparable in suddenness and violence with the vertigo, which it apparently replaces; or the sensory function of the fifth nerve may be attacked, and the patient suffer from paroxysmal neuralgia.

As regards the nature of the influence acting upon the bulb we are not yet in a position to speak with any positiveness. The fact that so many of the patients are clearly gouty offers some reason to think that it may be the presence in the blood of an uric-acid salt, or some equivalent, which is acting as the irritative agent.

It has long been the author's practice to prescribe salicylate of sodium in cases of vertigo associated with auditory nerve symptoms. He does this partly because the drug possesses an influence on the elimination of uric acid, and partly because it appears to exert some direct influence upon the centres in the medulla oblongata.

SURGERY.

UNDER THE CHARGE OF

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GUNSHOT WOUNDS OF THE CHEST AND WRIST.

G. S. THOMPSON (*The Lancet*, No. 13 of vol. ii., 1890, p. 661) reports a case of gunshot wound of the chest and wrist-joint, followed by complete recovery. The patient, a cavalry officer, was shot by a Martini-Henry carbine. One bullet entered the chest on the left side behind, at the level of the ninth rib below the angle of the scapula, and three inches from the spinal column. It traversed the chest and made its exit one inch below the left clavicle and three inches from the intraclavicular notch. Air bubbled from the anterior wound with a hissing sound during the movements of respiration. There were slight pain and difficulty of breathing. There was no hæmoptysis, wound emphysema, or internal hæmorrhage. The patient was at ease except for a sense of oppression and a slight pain behind the sternum during swallowing. The chest wounds were carefully examined by the finger for bleeding-points, damaged ribs, and foreign bodies. They were then washed out with an iodine solution and dressed antiseptically. The second bullet entered at the root of the thumb, between the radial artery and the median nerve, and external to the pisiform bone. It made exit half an inch external to the styloid process of the ulna and just over the wrist-joint. This wound was dressed in a similar way. The patient recovered with perfect use of the wrist.

The author remarks that none of the usual and what are commonly regarded as pathognomonic signs of wound of the lung were present in this case, except escape of air from the wound of exit and pain in the chest.

CYST OF THE PANCREAS.

TREVES (*The Lancet*, No. 13 of vol. ii., 1890, p. 655) reports a case of cyst of the pancreas which was cured by operation. The symptoms presented by the patient were indefinite in character. He was a vigorous, muscular man who had always been well until seven months before. He then noticed a throbbing sensation in the region of the umbilicus which was perceptible only when he lay upon the abdomen, and which ceased when he altered his position. A little later he noticed that he became tired sooner than usual, and had occasional dragging pains starting from the right testicle and spreading over the abdomen. He continued to work until five weeks before his admission to the hospital, when a tumor was discovered in the region of the

umbilicus for the first time. It was the size of two large fists, was rounded, and free from pulsation. When admitted to the hospital he was in the following condition: He had lost but little in weight; he had some nausea, but had never vomited; the bowels were regular, and the stools normal in appearance; there was no jaundice; the urine contained one-twelfth of albumin; there was neither hiccough nor disturbance of respiration; the tongue was clean. He appeared very weak and depressed, and exhibited the utmost lassitude. The eyes were sunken, and the expression was that of utter and hopeless melancholy. The complexion was of a dirty-brown color, not unlike fading sunburn; this color was limited to the face, and attracted immediate attention. The pupils were responsive to light, though they were contracted almost to pin-holes. He spoke like a man who is intensely drowsy. In the abdomen was a median tumor; its upper limit was three inches above the umbilicus and below it reached to the pubis; it occupied nearly the whole of the front of the abdomen. Before operation the idea of a cyst was never entertained; the mass appeared to be solid and heavy.

The abdomen was opened in the median line below the umbilicus. A greatly-distended cyst was immediately exposed; it was placed behind the peritoneum of the posterior parietes; the reflections of the peritoneum from the sides of the tumor onto the kidney and the meso-colon being noticed. The growth was in close contact with the spine as far as the fourth lumbar vertebra. The small intestines were, for the most part, below the tumor. The omentum, transverse colon, and stomach were above it. The tenseness of the cyst was remarkable; when punctured, a jet of fluid was projected with great violence. The cyst was freely opened, and the margins were attached to the parietal wound. A large drainage-tube was introduced in the cyst. Convalescence was easy. In three months the external wound was closed and the cyst obliterated. About one hundred ounces of fluid were contained in the cyst; it was thick, opaque, and of a brownish-red color; it was alkaline, contained many blood-corpuscles, some albumin, but no bile and no urea.

Treves thinks that Senn's statement that "a positive diagnosis of a cyst of the pancreas is impossible," must be modified, and that, with the knowledge we now possess, there is no reason why the condition should not, in all uncomplicated cases, be recognized.

TAIT'S FLAP-SPLITTING OPERATION FOR INCONTINENCE OF FÆCES.

HOOPER (*Australian Medical Journal*, vol. xii. No. 8, p. 353) reports a case of incontinence of fæces from injury to the sphincter ani, which was cured by Tait's operation on the perineum. The patient, a woman, had been operated on in 1883 for external hæmorrhoids. This operation was followed by a rectal abscess. In 1884 she was operated on for fistula. In 1885 she was cauterized about the anus on account of the intense pain which attended the daily evacuations. One month later she was etherized and free incisions were made about the perineum. From this time all her symptoms increased in severity; she had complete incontinence of fæces and a constant discharge of mucus and pus from the bowel.

Examination showed that the perineum was practically absent, being rep-

The interesting observation of Dr. Sutton, of London, in reference to the etiology of Pott's fracture, is quoted with apparent approval: "Dr. Sutton notices the comparative length of the external malleolus in man and adds: 'If this malleolus in man is compared with that of mammals, which so closely approach him in anatomical characters, it will be found to descend much lower.' He states that no one has ever described an example of Pott's fracture in a monkey, nor, indeed, in any mammal save man; he concludes that Pott's fracture is peculiar to the human kind, and occurs as a distinct result of the extraordinary length of the fibula malleolus, in that it affords excessive leverage when the foot is suddenly and violently twisted laterally, the force applied to the distal end causing the fibula to snap at some point in its lower fourth."

In reference to the correction of deformity after badly set Pott's fractures, the methods of Erichsen (subcutaneous division of the fibula and forcible adduction); Le Dentu (refracture and the employment of an osteoclast); Fenger (removal of a piece from the tibia and re-fracture of the fibula); and Sabine (subcutaneous osteotomy of both bones) are detailed.

In 1888 we saw in the wards of Professor Lister, in London, an interesting case which, in a letter to *The Medical News*, we described as follows: "One of the most striking cases which I saw was an operation for the relief of the deformity caused by badly treated Pott's fracture. The fibula had been broken at the usual point, and there had also been a fracture through the base of the external malleolus; the foot was so greatly everted that the limb was absolutely useless to the patient; this condition had persisted for more than a year. At the operation the soft parts were turned forward down to the bone by an incision following the posterior border of the fibula and of the external malleolus; the fibula was divided at the point of fracture, the triangular space existing between the lower edge of the fibula and tibia, which was filled up with fibrous material of almost bony hardness, was cleared with the gouge, chisel and sharp spoon; the soft parts over the internal malleolus were then turned forward by a similar incision, and the mass of new bone, which was easily recognized, and which filled up the gap between the two fragments of the malleolus, was chiselled away. After this the application of considerable force by means of pulleys brought the foot suddenly, but perfectly, into position. The subsequent course of the case was absolutely uncomplicated, and the patient, at the end of three weeks, already had considerable motion without pain in the ankle-joint."

We have recently done practically this same operation in a patient who had a similar deformity and with most excellent results.

In reference to dislocation of the acromial end of the clavicle upward Hamilton gives the usual unfavorable prognosis. The editor adds a description of the ingenious dressings employed by Dr. Powers, of New York, and Dr. Pilcher, of Brooklyn. We have had two cases, in both of which by the application of a dressing resembling these we have succeeded in getting an almost perfect result. In one of them, now more than eighteen months old, no difference between the shoulders is discoverable. In the diagnosis of this dislocation it may be useful to note that the vertical circumference of the shoulder is slightly increased, but to a less extent than in dislocations of the humerus; that the distance from the acromial end of the clavicle to the external con-

REVIEWS.

A PRACTICAL TREATISE ON FRACTURES AND DISLOCATIONS. By FRANK H. HAMILTON, M.D., LL.D., Surgeon to Bellevue Hospital, New York. New (eighth) edition, revised and edited by STEPHEN SMITH, A.M., M.D. 8vo., pp. 832. Philadelphia: Lea Bros. & Co., 1891.

THE eighth edition of Dr. Hamilton's well-known treatise has been improved in practical value by the judicious revising and editing of Dr. Stephen Smith, of New York, and still retains its old position, which is that of the most comprehensive and reliable work upon this subject in the English language. With the possible exception of the section on fractures contained in Agnew's *Surgery*, there is no other teaching on the subject which combines accuracy of statement, fulness of detail, and sound practical judgment as does this work.

In looking over it for evidence of the contributions of the present editor the following seem worthy of mention:

Dr. Smith quotes, with approval, the opinion of Dr. William Hunt, in reference to active and prompt laryngotomy or tracheotomy after fractures of the cartilages of the larynx, and adds the suggestion of Pick in relation to the employment of Trendelenburg's tampon-canula to aid in maintaining the cartilages in position after they have been restored.

In reference to fractures of the vertebral arches he quotes the cases of Macewen, Horsley, Gordon, and Dandridge, and adds: "Unsatisfactory as operations have thus far proved to be, there are exceptional cases in which they will prove useful. Macewen has thus expressed the opinion that is entertained by the most advanced surgeons on this subject: 'Traumatic lesions are, as a rule, so gross, and the destruction so complete, that in such operative treatment can be of little service. Still there are cases in which traumatism has produced localized pressure, primary or secondary, which can be relieved.'"

This can scarcely be regarded as entirely satisfactory in the face of the rapidly accumulating statistics of operations upon fractured vertebræ, showing a slight but progressive increase in favorable results. It is well, however, in a treatise intended for the guidance of the general practitioner, to err on the side of caution and conservatism.

In relation to fracture of the bodies of the vertebræ the recent results of treatment by suspension and plaster-of-Paris jacket are briefly discussed, and the experiences of König, Wagner, Burrell, and others are recorded.

The addition of the description of Bryant's ilio-femoral triangle is in our opinion of distinct value. We have found it in our own experience one of the most valuable methods of determining with the least possible disturbance of the patient the exact seat of a shortening known to exist somewhere between the ilium and the condyles of the femur.

In his introduction, Professor Peter emphasizes the fact that the patient's peculiarities influence very greatly the course and symptoms of his disease. He regards the malarial germ as an accompaniment, but not as the cause, of the disorder, and supports this opinion by an extensive clinical observation.

Dr. Pepper precedes his account of malaria as seen in Algiers, and its treatment, by a description of the country from the standpoint of the medical scientist, and the narration of the circumstances which led to an epidemic of malarial infection which came under his observation. He states most explicitly the best hygiene for foreigners living in Algiers, and this portion of his book cannot fail to be of great interest and value to any who may visit the country.

In the prophylaxis of malarial infection he has found precautions as to diet, clothing, and bathing of importance; also the use of a few drops of an arsenical solution, taken with coffee or any agreeable beverage, when the patient is fatigued.

His description of the symptoms of severe malarial infection is excellent, and might well be incorporated in standard works on diagnosis.

In the treatment of malaria in infants, he has found hydrobromate of quinine of use in early infancy; the hypophosphite in older children, and the valerianate in girls approaching puberty. The author writes fully regarding his use of quinine in adults, discriminating between the different salts and indications for their use. He has not often exceeded sixty grains in twenty-four hours in ordinary cases; in pernicious malarial infection he has given fifteen grains of the acid hydrochlorate hypodermically, accompanied by forty-five grains of the sulphate by the stomach at the same time.

In what is styled "bilious remittent" malarial infection, he has had good results from rectal injections of carbolic acid, with hypodermics of quinine, giving from fifteen to thirty grains of carbolic acid in twenty-four hours. Arseniate of strychnia with quinine is of great value in the profound nervous depression which accompanies severe infection. The author's formula, which has been adopted by the marine service of several tropical countries, is as follows:

R.—Sodium arseniate	.	.	.	.	.	gr. 3
Strychnia sulphate	.	.	.	.	.	gr. 1½
Distilled boiled water	.	.	.	.	.	℥ss 10½

To be used without filtering.

In the hypodermic use of the acid hydrochlorate of quinine he has found the best formula fifteen grains of the salt to half an ounce of saturated camphor-water, freshly prepared. In briefly mentioning these points we merely indicate to our readers some of the many instructive details which Dr. Pepper incorporates in his interesting treatise. The clinical histories in full of sixty-four cases form the basis of his deductions regarding treatment, and illustrate his methods.

We are interested to know what definition of malaria an acute observer like the author, placed in such favorable conditions to study malarial infection, may formulate of this common but not clearly defined malady. He states (p. 280): "Malaria is an infectious, feebly contagious malady, caused originally by telluric action, assisted by meteorologic influences affecting the electric status of the body and the nervous system; the infection gains access to the blood through the respiratory

dyle is increased, and that the distance from the same point to the suprasternal notch remains unaltered.

Unfortunately, like most other surgeons, we have had a much larger number of cases in which permanent disability of moderate extent resulted. Dr. Smith gives the following excellent amplification of Hamilton's statement that in compound dislocation the treatment should include "a judicious employment of antiseptic precautions and of drainage." The rule of practice should be as follows: "1. Determine the amount of injury which the structures about the joint have sustained. If the vessels and nerves are so far uninjured that the limb can be saved, determine upon reduction or resection. 2. In either case cut away tissues so bruised or torn that death is likely to ensue. Disinfect all the exposed surfaces with hot sublimate solutions (1:4000), the water being injected forcibly with a bulb-syringe. The solution should be of a temperature of not less than 130° to 140° , or so that the hand can scarcely be retained in it. If of the proper temperature the irrigated tissues will be changed to a dull-gray color. The greatest care is necessary to force this solution into every part of the joint, and among the tissues. 3. Reduction or resection should now be effected with little strain upon the tissues. 4. Ample drainage should be provided, the drainage-tube or tubes extending to every recess. 5. The wound should be closed by the union with suture of all divided tissues which can be brought into easy apposition. 6. Antiseptic dressings, enveloping the parts sufficiently, should be applied; and to maintain rest a plaster-of-Paris dressing may be required, as at the knee or ankle. These dressings should not be changed for three or four weeks, unless there is evidence of disturbance in the wound. The tubes should be removed in four or five days by opening fenestra where they are located."

All this seems very sound, the only criticism which suggests itself to us being the direction to leave the dressings undisturbed for three or four weeks, unless there is evidence of trouble in the wound. It is certainly true that in the great majority of cases a safer routine method would be to inspect carefully at an earlier date than this, with, of course, all possible precautions as to unnecessary movement.

Many valuable additions have been made in almost each chapter of the book, and we may repeat our hearty indorsement of it as a safe and reliable guide to the general practitioner.

J. W. W.

DE LA MALARIA. Par DR. EDOUARD PEPPER, L.F.P., Algiers. Précédé d'une Introduction par M. LE PROFESSEUR PETER. Paris: G. Masson, 1891.

A CONTRIBUTION TO THE STUDY OF MALARIA, AS OBSERVED IN ALGIERS. By DR. EDWARD PEPPER, L.F.P.

THE author of this interesting volume is an American physician of recognized attainments in France, who having won distinction in the Franco-Prussian war, and being in impaired health, has made Algiers his residence. He has profited by the opportunity there offered to study malarial infection, and dedicates his treatise to his friend Professor Peter, of Paris.

but only "where the flow is scanty and insufficient stimulus is a probable source of the dysmenorrhœa." Stress is laid upon the fact that the galvanic current, when used in cases of chronic oöphoritis accompanied by severe local pain, simply relieves the neuralgia, but does not exert any miraculous curative effect upon an ovary which is the seat of actual organic disease. While affirming that the proper application of electricity restores tone to the relaxed supports of a displaced uterus, the authors do not share in the enthusiasm of some electro-therapeutics, who claim that displacements can be cured by this agent alone. "A fact to be emphasized is that the use of electricity does not, as has been claimed, enable us to dispense with pessaries."

The section on the electrical treatment of diseases of the adnexa ought not to give offence, even to the avowed opponents of conservatism, since the authors simply plead for a fair trial of this agent before resort to abdominal section. "To make one of these suffering women comfortable," they conclude, "if not to entirely cure her, by means of electricity, redounds more to the credit of the gynecologist than if he sterilizes her and still does not cure her."

To those who desire a lucid statement of the theory and practice of electrolysis for uterine fibroids we commend Chapter III. So much that is obscure and confusing to the general reader has been written on this subject that it is gratifying to have the entire matter satisfactorily explained.

A monograph written by two individuals must necessarily be somewhat uneven. In the one before us, however, the dual element is seldom noticed, each author adhering to his one line of work. The style is clear, unpretentious and effective. The book is an honest book by honest men, and, as we said before, can be relied upon as a safe guide to the inexperienced, while the specialist will find in it not a few useful hints. The illustrations are numerous, well-executed, and possess the rare merit of freshness.

H. C. C.

DU CHIMISME STOMACAL (DIGESTION NORMALE—DYSPEPSIE), par GEORGES HAYEM, Professeur de Thérapeutique à la Faculté de Médecine de Paris, Membre de l'Académie de Médecine, Médecin de l'Hôpital Saint Antoine, et J. WINTER, Préparateur du Laboratoire de Thérapeutique à la Faculté de Médecine de Paris. Pp. 274. Paris: G. Masson, 1891.

CHEMISTRY OF THE STOMACH (NORMAL DIGESTION—DYSPEPSIA). By GEORGES HAYEM, Professor of Therapeutics of the Faculty of Medicine of Paris, Member of the Academy of Medicine, Physician to the Hospital Saint Antoine, and J. WINTER, Preparator of the Therapeutic Laboratory of the Faculty of Medicine of Paris.

THIS little work embraces original researches in the chemistry of the stomach, in two principal parts. The first comprises the consideration of the normal, and the second of the abnormal chemical functions of the stomach.

After an exhaustive general review of the various chemical theories of the digestive process, in which great stress is laid by the authors on

organs, less often through the digestive tract." The book is handsomely published, and will adorn and enrich the library of the physician or the traveller.

E. P. D.

PRACTICAL TREATISE ON ELECTRICITY IN GYNECOLOGY. By EGBERT H. GRANDIN, M.D., Chairman of the Section on Obstetrics and Gynecology, New York Academy of Medicine; Obstetric Surgeon, New York Maternity Hospital; Obstetrician, New York Infant Asylum, etc., and JOSEPHUS H. GUNNING, M.D., Instructor in Electro-therapeutics, New York Post-Graduate School and Hospital; Gynecologist to Riverview Rest for Women; Electro-gynecologist, Northeastern Dispensary, etc. Illustrated. Pp. 171. New York: William Wood & Co., 1891.

THE appearance of a new monograph upon the application of electricity to diseases of women is a proof of the importance which this therapeutic agent has assumed in gynecological treatment. In reviewing in this journal the recent work upon the same subject, we took occasion to question the advisability of recommending the use of what may be called the refinements of electro-therapeutics by the general practitioner, and we are still of the opinion that even gynecologists who have not made a special study of the theory and practice of electrolysis, and are provided with all the expensive apparatus necessary for its proper application, ought to refer their patients to an expert who is prepared to make a rigid scientific test of the method. The statistics of tyros in this department are valueless from a scientific standpoint; they only serve to place the subject in a false light before the profession. It is fair neither to our patients nor to medical science for us to employ electricity simply for "effect." In no other branch of therapeutics is it so true that "a little knowledge is a dangerous thing." Of all the manuals on this subject which have appeared, we regard the present one as the safest and most conservative. "The agent is considered," we read in the preface, "not from the standpoint of a specific, but as a valuable adjuvant to routine therapeutic methods"—a claim to which no fair-minded man can take exception.

The first chapter, including nearly one-third of the book, is devoted to a discussion of theoretical questions and descriptions of apparatus, and is unusually well illustrated. The brief closing paragraph on contraindications to the use of electricity might with propriety have been extended to several pages; it is extremely important for the general practitioner to learn clearly in exactly what class of cases electricity should *not* be used, though we doubt if any but an expert gynecologist is really competent to recognize this at the examining-table.

Chapter II., on "Routine Uses of Electricity," will undoubtedly prove of the more practical value to the ordinary reader than will the succeeding carefully elaborated chapter on "Electrolysis." We are glad to see that the authors regard dysmenorrhœa rather as a "symptom complex," than as a single symptom referable purely to a gross local lesion or abnormality. It is only by viewing the subject in this way that we can understand the undoubted analgesic effect of the continuous current. The point is made that the tension faradic current, with the bipolar intra-uterine electrode, is not to be used indiscriminately,

as erroneous, owing to the liberation by heat of HCl from loosely combined organic chlorides, the same fault must inversely attach itself to their method, in so far as they may be said to *produce* the organic chlorine compounds in their process of analysis. While this is not proven, it certainly cannot be, or is not, disproven by them, as their principal factor upon which they base their conclusions is at best hypothetical. That there are in the gastric secretions albuminoid matters is not to be disputed; that these change under the effect of heat at and below 100° C. is another fact; that under such conditions bases form which combine with the free HCl of the gastric juice is very probable, and that their deduction therefore of an existence of organic chlorine compounds in the *fresh* gastric juice is not established becomes apparent.

The experiments of Prout and so many others are in fact much more conclusive, and lean toward the assumption that in the fresh gastric juice HCl is present in its free state. It might be said that the constancy of their value C (chlor-organic compounds) may be claimed in support of their theory, but this might as readily be explained by a constancy of the albuminoid matter in the gastric juice and the bases produced by their process of evaporation.

The chapter on the normal evolution of the gastric digestion is quite ingenious and interesting, but it is, after all, only a defence of their theory of the preëxistence of organic chlorine compounds in the gastric juice. They value the digestive power of the gastric juice by the relative proportion of the organic chlorine compounds with the abnormal (not HCl) acids. Thus they arrive at a formula in which A is total acidity, H free hydrochloric acid, and C organic chlorine compounds; these yield the digestive utility of the gastric secretion, as $\frac{A-H}{C}$, to which

they give the term, and according to its decrease or increase over the normal, which they found as 0.86, they classify pathological peptic acts as respectively hyperpepsia and hypopepsia. These, in turn, they subdivide in three degrees, of which the last of the latter is equivalent to apepsia. They also give a class of simple dyspepsia, in which the peptic disturbance does not arise from a marked variation of the chemical values.

A most disturbing element in their deductions appears in speaking of the factors to which the total acidity of the gastric juice is due; they declare on page 105: "After our experiences, the free hydrochloric acid, the organic acids, and the acid phosphates present together a value which represents in the normal state but a small part of the total acidity. *The greatest part of the total acidity comes from the hydrochloric acid compounds with albuminoids in solution;*" whereas, on page 241, in referring to cases where the total acidity is nothing, and the organic chlorine compounds are given respectively as 0.055 and 0.202, they say, "While the total acidity is nought, the chloro-organic products are *deprived entirely of the acid function.*" If a factor for gauging the peptic act is subject to such abnormal qualitative conditions, it can, in our opinion, scarcely be classed as the controlling element of digestion; besides, it may be presumed, that in part, if not altogether, as most probably in the last cases cited, these organic chlorine compounds are principally ammonium chloride derived from the free HCl secreted in the stomach, acting during the evaporating process (by which it becomes concentrated) on the nitrogenous compounds of the gastric juice.

the conclusions of Richet that the principal part of the hydrochloric acid is secreted and contained in the stomach as organic compounds of chlorine, they deal with a discussion of the methods of analysis of the gastric juice. The principal point of interest of this centres on the quantitative determination of free hydrochloric acid of the stomach. The method of Bidder and Schmidt they consider to be simply demonstrating that a certain amount of chlorine is present in the gastric juice otherwise than combined with mineral bases, also the quantitative results of Prout's researches as derived by his method of distillation, by which they claim the hydrochloric acid is by heat liberated from the organic bases it is combined with. The clinical results of Ewald and Boas they think illusory, and of qualitative value only, as the organic chlorine compounds are by them neglected. All the previous methods, qualitative and quantitative, they condemn as not taking into consideration the organic compounds of chlorine, which with them, as with Richet, appear to have become foregone conclusions, and a matter of the greatest importance in the chemical work of the stomach.

The authors describe at length and base their subsequent observations on the process of M. Winter, which we will describe here briefly, as it forms the principal point of the whole controversy on the subject. This method is intended to furnish: 1. The total chlorine; 2. The fixed chlorides (mineral compounds of Cl); 3. The difference between the two as hydrochloric acid, both free and in combination with organic matter; 4. The difference between the total of the two latter and the amount of HCl that can be dissipated by a temperature not exceeding 100° C., as the chlor-organic compounds.

The determination of the three values to be ascertained is by titration with the deci-normal solution of silver nitrate. Three specimens of 5 c.c. each of the gastric juice are obtained. To the first is added an excess of sodium carbonate, after which it is evaporated, and finally incinerated. The titration of this yields the total chlorine, to which they assign the letter T. The second portion is evaporated over the water-bath to dryness, and then for one hour more; the residue is mixed with sodium carbonate, incinerated and also titrated. This gives the fixed chlorides plus the non-volatile hydrochloric acid (organic chlorine compounds). This subtracted from the total chlorine (T) leaves the amount of free hydrochloric acid, termed H. The third part is evaporated and incinerated without addition of sodium carbonate. It gives on titration the fixed chlorides, designated as F. The third result, subtracted from the second, leaves the amount of chlor-organic compounds, including also *ammonium chloride*.

The authors claim that if carefully done this process will always give accurate and reliable results, which in their cases, with normal secretions, have been remarkably constant. It might seem that they had at last solved the Gordian knot, and presented alike an accurate and ready method for quantitative estimations of the HCl in gastric juice, as well as established the presence of HCl not volatile at 100° C., in excess of that fixed by mineral bases. The constancy of their results would also tend to make the organic chlorine compounds a factor of importance, and thus they would bring us at once to a new epoch in our knowledge of gastric chemistry, could they present to us also the evidence of the existence of their organic chlorine compounds in the *fresh*—i. e., not heated and evaporated—gastric secretion. When they claim the results of Prout

If anyone should still object to the alleged failure to annihilate existence at the first electrical contact, let him contrast the expedition with which the possible failure was corrected and converted into an unquestionable success, with the horrible delays that attend the replacement of a broken rope in execution by hanging. Contrasting the details of the present report with the records of execution by other methods, the electrical method has everything in its favor. Read, in the blood-stained annals of history, how in the agony of death, high-born noblemen and gentle women, breaking away from the block, have been chased around the scaffold by the executioner with his bloody axe, and have only been felled by a succession of blows upon the head, shoulders, and neck. Witness the frightful scenes of a military execution: bodies perforated with bullets, yet weltering in conscious pain until life is finally ended by the sergeant's merciful pistol-shot through the head. Nor does the expeditious work of the guillotine prevent horrible anguish on the part of the wretch who is hurried from his bed into the cold prison-yard at dawn of day, strapped to a plank, and shoved under the knife that severs his bleeding head from a struggling trunk. Rough and painful are the preliminaries of all these processes; whereas, in the case before us, the victim of the law was quietly and comfortably placed in a chair, with no terrifying apparatus in sight. One contact, and all possibilities of sensation and consciousness were instantaneously annihilated. He could not have known that he was dying. This, certainly, is a perfection of euthanasia that even anæsthetics and poisons cannot procure.

As a result of the experience acquired in this execution Dr. MacDonald recommends:

"1. The statute providing for the execution of criminals by electricity should be amended so as to provide for but one plant, to be located in the central part of the State, in a building especially constructed for the purpose. This building should contain the necessary electrical apparatus, an engine, execution-room, solitary cells, and quarters for the guards and other necessary officials, the apparatus to be in charge of and operated by a competent, accredited electrician.

"2. The engine and dynamo should be especially constructed for the purpose, and should be capable of generating an electro-motive force of at least 3000 volts, in order to insure the maximum voltage that would be necessary, and at the same time cause no injustice to any electrical lighting company, such as is likely to be the case so long as commercial dynamos are used in executing criminals.

"3. The volt-meter should be located in the execution-room, and a competent and responsible official should be detailed to take the readings of the meter before and at the instant the current is applied. The voltage should not be less than 1500 nor more than 2000, and should be a matter of official record. The prisoner's [electrical] resistance should also be taken immediately before bringing him into the execution-room.

"4. The statute should require an official report of each execution to be made to the Governor within ten days after the execution takes place."

H. M. L.

This volume is, however, a most remarkable one, full of original thought, and the casuistic presented shows an almost unparalleled industry on the part of the authors. Their lines of research are so entirely original that the perusal of their work is of the greatest interest to those who give more earnest study to gastropathies.

To admit that the authors are right in their premises would upset all present doctrines regarding digestion and its perverted state, and at once start a gastro-pathology, which, in its complications, would lead to utter confusion. We admit the brilliant conception and the laborious elucidation of the leading idea, which it seems hard to supersede in some of the great minds of the French medical schools. Ever since the hydrochloric acid digestion of albuminoids was proven there have been periodical attempts to prove the supposed existence of the organic chlorine compounds. So far this has not been done, and Professor Hayem leaves this point as problematical as it was after the researches of Richet.

To students of gastro-pathology we can recommend this little work as most interesting reading, though we differ essentially with the hypothesis it attempts to prove.

L. W.

REPORT OF CARLOS F. MACDONALD, M.D., ON THE EXECUTION BY ELECTRICITY OF WILLIAM KEMMLER, *alias* JOHN HART. Presented to the Governor of New York, September 20, 1890. Pp. xx.

THE importance of its subject justifies a reference in these pages to this brief document. To those whose notions about the execution of criminals by means of electricity have been derived from the sensational romances of the daily press, this report will prove an excellent corrective.

The autopsy was held about three hours after death, but, with the exception of the local desiccation caused by too prolonged contact with the heated electrodes, nothing was discovered but the ordinary appearances produced by a fatal charge of electricity.

In spite of minor defects in the apparatus, and its mode of application, which were inevitable by reason of inexperience, it is the opinion of the distinguished reporter that—

“Compared with hanging, in which death is frequently produced by strangulation, with every indication of conscious suffering for an appreciable time on the part of the victim, execution by electricity is infinitely preferable, both as regards the suddenness with which death is effected, and the expedition with which all the immediate preliminary details may be arranged. . . . The execution of Kemmler, from the time he entered the room until the second contact was interrupted, occupied not more than eight minutes; whereas, executions by hanging usually require from fifteen to thirty minutes. In fact, it not infrequently happens that the heart continues to beat for that length of time after the fall of the fatal drop. Then, too, far more time is consumed in placing the prisoner on the gallows, pinioning his limbs, putting on the black cap, placing the noose about his neck, and carefully adjusting the knot under his left ear . . . than would be required for arranging the preliminary details of an electrical execution.”

resented only by a thin muscular septum between the vagina and rectum. The external sphincter was useless. There were three sinuses about the anus. Tait's flap-splitting operation was resorted to to repair this mutilation, with a perfect result. As the writer says, this case furnished a crucial test of the value of Tait's operation.

BRAIN SURGERY.

WALKER (*Med. and Surg. Reporter*, vol. lxiii. No. 8, p. 213) reports eleven cases of brain surgery.

There were two cases of compound fracture of the skull in which fragments of bone were driven through the dura mater into the brain. Trephining was performed and the fragments of bone were removed, with recovery in both cases. There were three cases of fracture of the base of the skull accompanied by intracranial hæmorrhage. The indications for trephining were the pressure-symptoms. Two of these cases recovered. There was one case of intracranial hæmorrhage without fracture. Trephining was performed six days after the injury and five ounces of coagulated blood were removed from between the skull and dura mater. The patient recovered.

There were two cases which received no benefit from operation: one was a case of supposed ancient intracranial hæmorrhage and the other a case of epilepsy.

The lateral ventricles were tapped for effusion in one case. The method of operating was that proposed by Keen. The trephine was placed $1\frac{1}{2}$ inches behind the meatus and $1\frac{1}{2}$ inches above Reid's base-line; the puncture being made toward a point $2\frac{1}{2}$ inches directly above the opposite meatus. A considerable quantity of serous fluid was removed in this way; the patient, however, died in seven hours. The reporter is of the opinion that death was due to compression from hæmorrhage, which was caused by the operation. No autopsy was made. There was one successful case of trephining for epilepsy, which followed traumatism four years previous to operation.

Finally, there was a fatal case of operation for brain tumor. The tumor was not discovered at the operation. The autopsy showed it to be a cyst which had its origin at the apex of the petrous portion of the temporal bone.

CHOLECYSTOTOMY.

HALL (*Cincinnati Lancet-Clinic*, New Series, vol. xxv., No. 14, p. 405) reports a case of cholecystotomy for obstruction of the common duct by an impacted gall-stone. The operation was performed in the usual way: five stones being removed, four from the gall-bladder and one from the common duct. The gall-bladder was stitched to the abdominal incision. The fistula closed in twenty-one days, and remained closed for over a month; all symptoms of obstruction to the flow of bile having disappeared. Two months after the first operation the gall-bladder again became distended, and over a pint of bile was removed through a second incision. The patient continued to suffer with repeated attacks of obstruction, and died of exhaustion four months after the primary operation.

At the autopsy a stone was found in the common duct. The author thinks

PROGRESS

OF

MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF
FRANCIS H. WILLIAMS, M.D.,
ASSISTANT PROFESSOR OF THERAPEUTICS IN HARVARD UNIVERSITY.

TREATMENT OF EPILEPSY BY THE CONJOINED EMPLOYMENT OF BROMIDE OF POTASSIUM AND OF AN AGENT CAPABLE OF RENDERING THE NERVOUS CENTRES ANÆMIC. .

Under this head POULET, of Plancha-les-Mines, in the last *Bulletin général de Thérapeutique*, writes of a combination of bromide of potassium with Calabar bean, which has given him success in the treatment of obstinate cases of epilepsy where the bromides alone had failed. A favorite formula of his is the following:

Bromide of potassium	100 parts.
Tincture of Calabar bean	35 "
Water	470 "

Dose: A tablespoonful, to be increased to a tablespoonful and a half, then two tablespoonfuls, daily.

A tablespoonful contains about fifty-seven grains of bromide, and about sixteen minims of the tincture. The medicine may be given in divided doses instead of in one full dose, half a teaspoonful being given at first twice, then three times, then four times a day.

Poulet reports five obstinate cases treated in this manner. These were cases where bromide alone failed to cure:

1. The fits were formerly six or eight a week (*grand mal*). After a year of the new treatment, no return of the epilepsy. In this patient the tincture of Calabar bean is occasionally replaced by eserine, in the dose of one-sixty-fourth of a grain to each fifteen grains of bromide; the result has been the same. No contraction of the pupil has been observed during the administration of the medicine.

2. A most obstinate case; had been epileptic for eight years, eight or ten fits a day. Failure of bromides, given alone, also of bromides and picrotoxine. Definitive cure under bromides associated with tincture of Calabar bean.

3. Also a case of chronic, inveterate epilepsy. Several months' treatment by the combination specified has given exemption from all convulsive accidents.

4. A case of grave epilepsy at the menopause. Frequent daily vertiginous attacks ending in convulsions and stupor. At first the disease was successfully combated by bromide of potassium associated with picrotoxine; this combination afterward failing, sulphate of atropine was substituted for picrotoxine (ninety grains of bromide of potassium and one-sixty-fourth of a grain of atropine daily). The latter treatment has been kept up for a year, with complete cessation of the vertigo.

5. A case of cardiac epilepsy. The *grand mal* attacks were followed by hemiplegia with stupor and hebetude (*état de mal*). A combination of bromide and digitalis caused disappearance of the epilepsy (120 grains of bromide associated with 30 minims of tincture of digitalis in divided doses daily).

Poulet terminates his article by the following conclusions:

The bromides remain the sheet-anchor in the treatment of epilepsy, and by the term *bromides* we have especial reference to the bromide of potassium, which alone is truly efficacious.

There are, however, a great many epileptics whose attacks are only mitigated or postponed, not completely suppressed, by bromide of potassium.

In such cases if we associate the bromide with some medicament which possesses properties identical with those of the bromide (that is, being capable of anæmiating and decongesting the nerve-centres and paralysing the system of voluntary muscles) we generally obtain results which are perfectly satisfactory in essential epilepsy, and even in partial or Jacksonian epilepsy, on condition that, in the latter, we begin by the specific treatment of the determining cause. The substances that have been most successful are Calabar bean, picrotoxine, and belladonna. In cardiac epilepsy digitalis must be added.

We may indifferently substitute sulphate of eserine for the preparations of Calabar bean, sulphate of atropine for those of belladonna, and digitaline for digitalis.

SOME NEW USES FOR SALINE PREPARATIONS.

DR. JOHN STRAHAN points out some uses for saline preparations which would not be recalled to the minds of many practitioners.

Thus, in pleurisy it is known that salines produce an outpouring of fluid from vessels in the intestinal canal, as well as a greatly increased secretion from all the glands of the mucous membrane. Nothing better reduces abnormally high arterial tension, because, if the abdominal vessels are much filled, pressure must fall generally. Thus a saline purge will often relieve renal congestion, and thus act as the best diuretic. Even in the healthy a saline purge will often greatly increase the quantity of urine, although a great quantity of fluid has been discharged by the bowels. For such purposes

salines should be given in only as much fluid as will dissolve them. Their affinity for water must then be met by exosmosis through the intestinal capillaries. In some cases of general anasarca, whether cardiac, renal, or merely anæmic, the effects of a few half-ounce doses of sulphate of magnesium is very striking and can only be approached by puncture of the swollen leg. Such treatment is often of advantage in acute, subacute, or even chronic pleurisy.

The salines will act just as freely and as promptly in the case of a patient under the influence of morphine or opium as if such drugs were not present, which is often an advantage, and which can hardly be said of any other purgative. An ounce of sulphate of magnesium will produce a full watery movement in two or three hours, and without the slightest griping or pain, in a man who is narcotized by opium.

Milk diet is a valuable accessory to this method of treatment; so also in general renal and cardiac dropsy and anasarca the salines act as efficient diuretics by removing stasis of the renal veins, and in ascites from portal obstruction salines are still more useful, as they act directly on the organ concerned. The œdema of the lungs and œdema of the brain, which so often imperil life in Bright's disease, are usually more quickly and decidedly benefited than by any other plan of treatment, while it is known that free purging in cases of dropsy or anasarca is not followed by weakness and exhaustion, as it would be in other cases, or even in health. As a rule, it is best to prescribe the sulphate of magnesium in mixture with dilute sulphuric acid and extract of licorice, which quite disguises the taste. If the sulphate is ordered, four- or even two-drachm doses every four hours will cause a profuse but painless diarrhoea which is perfectly within the control of the medical attendant.

Again, in uræmic cases, and irritable and inflamed states of the stomach and intestines, salines may be freely and painlessly employed when no other purgative would be dreamed of, except, perhaps, calomel. The circumstances which exclude salines, with all other purgatives, are inflammation and probable perforation of the vermiform appendix, perityphlitis, and peritonitis from perforation. Fecal impaction and simple typhlitis are, on the other hand, strikingly remedied by salines when other purgatives may cause enteritis or peritonitis, while croton oil, jalap, senna, etc., cause violent excitation of the muscular coat of the bowels, and thus often intense pain in the bowels of the healthy. If the irritability of the stomach be so great that constant vomiting prevents the administration of salines through the mouth, they may then be given by enema, and two ounces of sulphate of magnesium as a purgative enema will be thoroughly satisfactory with its quickness, thoroughness, and its perfect painlessness. A good formula is: Sulphate of magnesium two ounces, glycerin one ounce, water enough to make four ounces; this is unirritating, and is perfectly reliable. The glycerin in this formula is undoubtedly a useful adjuvant; but while glycerin produces solid stools, the salines in the formula lead to the excretion of large amounts of liquid, and consequently a fluid passage. In stricture of the intestine, as in cancer of the rectum, nothing can equal salines which cause fluid stools—generally painless ones; for salines liquefy the feces, so that they may pass through the narrow gut without pain or straining, thus avoiding danger of perforation

or rupture. This also applies to all diseases of the rectum attended by difficult defecation, such as ulcers of the anus.

In lead colic, in acute dysentery, and in rectal and pelvic hemorrhage, especially if the latter condition is due to constipation, they may be used.—*Provincial Medical Journal*, vol. cx., 1891.

IN ACUTE BRONCHITIS.

A simple expectorant mixture in acute bronchitis is:

R.—Ammon. muriat. $\bar{5}$ ss.
Mist. glycyrrhiz. comp. $\bar{5}$ iv.—M.

Sig.—Take a dessertspoonful every four hours.

The dose is smaller in the extremes of life, and in severe coughs it is given every three hours.

Tablets of the muriate of ammonium and the compound licorice mixture are very efficient. When the secretions are with difficulty brought up, the use of senega is advised.

When the secretions are abundant and not easily coughed up, turpentine in emulsion is an excellent remedy, not so pleasant, perhaps, as terebene or terpine hydrate, but rarely failing to do good in properly selected cases. The formula, with occasional modifications to suit particular cases, is:

R.—Ol. terebinthin. 5ij. to 3ijj.
Mucil. acaciæ q. s.
Aq. cinnamomi $\bar{5}$ j.
Aque q. s. ad $\bar{5}$ vj.—M.

Sig.—A tablespoonful in a little water every four hours.

Oftimes the cough is of such an irritating character that these ordinary expectorant mixtures avail little; then recourse must be made to a narcotic in some form. Codeine, a very useful alkaloid of opium, has the advantage of not constipating as much as morphine. A good combination is:

R.—Codeinæ sulphat. grs. viij.
Syr. prun. Virginian. $\bar{5}$ ij.—M.

Sig.—A teaspoonful in a little water three or four times a day and at bedtime if necessary.—*Therapeutic Gazette*, July, 1891.

WHOOPIING-COUGH TREATED BY ATOMIZATION.

DR. H. ERNEST SCHMID states that he now relies entirely upon atomization for the treatment of whooping-cough in all stages of the disease. The spray which he uses is made up as follows:

R.—Carbolic acid grs. vj.
Menthol, 4 per cent. solution 5iv.
Cocaine, 3 “ “ 5ijj.
Glycerin 5j.
Cherry-laurel water q. s. ad 5j.—M.

This solution should be thoroughly used, brutally if necessary, by an atomizer every three hours; force may be employed if necessary, and disre-

garding any apparent strangling upon the part of the little one during vigorous atomization, the nozzle of the instrument should be directed as far into the mouth of the patient as possible. During the struggling and sputtering and strangling some deep respirations will before long be made, and the object is accomplished. At first, in most cases, a violent paroxysm of coughing may result from the spraying, especially if much force has to be used with the child, but these soon cease and palpable effects are soon noticed by the parents. The point is to be able to impress the importance of perseverance. Dr. Schmid has seen whooping-cough arrested by this means after one thorough spraying, the cough continuing without the whoop for a while, and perfect recovery has followed in one or two weeks. From his success, he feels justified in claiming that the method promises to be more efficient than other means of treating the disease.—*Medical Record*, June 13, 1891.

TREATMENT OF CONSTIPATION IN CHILDREN BY ABDOMINAL MASSAGE.

KARNITZKY describes this method of treatment in both acute and chronic constipation in children from eight to twelve years of age. He concludes that abdominal massage may produce effects upon the alimentary tract, in connection with digestion, which are not inferior to those produced by purgatives. Habitual constipation may be easily cured by massage without the aid of purgatives, and the more readily the younger the child. The younger a child is the milder should the manipulations be and the shorter the séances, which should be from three to ten minutes, according to the age of the patient. Longer séances are inadvisable, and may even be harmful and aggravate the condition of the patient. Abdominal massage may be regarded as the best means of treating constipation in children. Purgatives should only be used in exceptional cases.—*Journal de Médecine*, 1891.

ALOÏN.

PROFESSOR HANS MEYER, of Marburg, has examined chemically and physiologically the aloïn obtained from various kinds of aloes. From the Barbadoes and Curaçoa he obtained the same crystalline substance. Natal aloes yielded a somewhat different aloïn. In experiments on animals and on man the aloïn was given per os and also subcutaneously. The aloïn can be detected in the feces and urine by tests which are given at length and which are extremely delicate. Experiments showed that aloïn acted with certainty as a purgative, whether given by the mouth or subcutaneously. The dose in both cases is about the same, which is explained by the fact that aloïn, when given hypodermically, is excreted from the blood chiefly into the bowel, only a mere trace, or none, being found in the urine. In man, dogs, and cats, there is no albuminuria after subcutaneous injection, but in rabbits—in which animals aloes does not cause purgation—subcutaneous administration is always followed by inflammation of the kidneys, albuminuria, and death. Its purgative action is as slow when it is given hypodermically as it is per os. Natal aloïn by subcutaneous injection is always active. In man on an ordinary mixed diet it had but little effect, but in mau fed exclusively upon an animal diet it was much more active. The reason prob-

ably is that in the latter case the putrefactive processes in the intestine are much more marked, and the aloin is decomposed into a more active substance. All the experiments seem to point to the conclusion that aloin itself is not an active purgative, but that it becomes gradually decomposed in the intestine into a more active body, and hence the slowness of its action.—*British Medical Journal*, 1891.

DIURETIN AS A MEANS OF REMOVING DROPSY.

DR. ROBERT H. BABCOCK has used diuretin with good results in three cases, and considers that in this remedy we have a useful drug. The alkaloids caffeine and theobromine are diuretics of great power, but the former has the drawback of primarily increasing arterial tension by its stimulation of the vasomotor centres. An objection to caffeine in large doses, say five to ten grains three or four times a day, lies in the nervousness and insomnia of which patients are apt to complain. Moreover, the system becomes speedily accustomed to its effect, necessitating the employment of increasing doses.

This remedy is readily soluble in warm water, and had better be administered thus or in pill form, since, if exposed to the air, as in powders, it undergoes a change. The daily dose is large—sixty to one hundred and twenty grains in twenty-four hours. It may be given in divided doses of fifteen grains each.

His conclusions are that diuretin is a diuretic of great power and promptitude, suitable to all forms of dropsy. Since it does not increase arterial tension, it is likely to succeed where digitalis, caffeine, and their congeners fail. In cases of cardiac dropsy with great feebleness of the pulse and erythema, it will strengthen and regulate, rather than depress, the heart's action.

It appears to cause no irritation of the stomach or kidneys, and requires to be given to the extent of from ninety to one hundred and twenty grains daily, and preferably in small doses frequently repeated.—*New York Medical Journal*, July 11, 1891.

TREATMENT OF CHYLURIA BY THYMOL.

Two cases are reported, in which the filaria sanguinis was found, where complete cure followed the internal use of thymol. The first case was that of a man twenty years of age. The urine was white. Quinine and many other remedies were tried without any result; the urine remained milky and the patient's fever continued. Thymol was given every four hours in doses of five-sixths of a grain. Fifteen days later the dose was doubled. A month after this treatment the patient was cured and no more filariæ were found in the blood. The other patient was relieved under the same conditions after a month's treatment, taking the same dose three times a day.

These two cases suggest that the thymol destroys these organisms in the blood and in the tissues. The author has tried the effects of thymol upon other pathological organisms, such as the bacillus of tuberculosis and of leprosy, but without any result.—*Bulletin général de Thérapeutique*, 1891.

MEDICINE.

UNDER THE CHARGE OF

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MALTA (REMITTENT) FEVER.

GADDING (*British Medical Journal*, 1891, No. 1585) gives an analysis of forty-two cases occurring on H. M. S. Agamemnon.

The writer describes three types: Enteric type, always severe and generally supplying the fatal cases. Remittent type, with high initial temperature, marked remissions and tendency to relapses. Hybrid type, supplying 60 per cent of the cases. The primary attack is often trivial and of short duration. Rheumatism of an obstinate character is a common sequela and relapses of a severe nature are common. These cases are variously described as "Malta fever," "sweating fever," "typho-malarial," and "undefined climatic fever."

Etiology: The disease commences almost invariably in the spring. A few cases followed exposure to a hot sun. In four cases trifling injuries, bruises, and sprains appeared to determine the attack. Exciting causes: Malarial poison plays an important part, but true ague is not often seen. The disease is no doubt largely filth-produced, and improved drainage and water supply have lessened the virulence of type. The poison concentrates its force on the lymphoid structures of the alimentary canal (tonsils and Peyer's patches), thus accounting for the resemblance to typhoid fever; but the disease must not for this reason be assumed to be typhoid.

Duration: One week to six or seven months. Only eight made perfect recoveries, and were from one to six weeks under treatment. No eruption was noted in any case.

Symptoms and complications: Acute orchitis was noted in seven cases. Rheumatism occurred in nearly all at some period of the attack, and was often a troublesome sequela. Pneumonia was observed in three cases, the signs rapidly clearing in two. One death occurred from secondary pneumonia.

Diagnosis: The majority of cases point strongly to a malarial origin. The chief points of difference from true "remittent" are: (1) absence of splenic and hepatic enlargement; (2) powerlessness of quinine to cure, and (3) character of the complications—rheumatism, orchitis, tonsillitis, etc. The disease really defies all treatment. The one efficient remedy is change of climate.

In the opinion of SURGEON DAVID BRUCE, M.S., founded on an experience of 400 cases in the Military Hospital at Valetta, Malta fever is in no sense a

with prolonged life and great mental vigor. It was important to note that in such examples the bradycardia was not attended with dyspnoea. It was not infrequently an accompaniment of old age, but an age which might be attended with no other sign of decay or degeneration. There was also a group of cases which, for want of a better term, might be called "functional." They were usually an accompaniment of indigestion, or some other disorder of stomach or other organ. They were temporary only, and were not attended with any signs of heart lesion. - (B.) Cases the result of disease. Here the assertion that disease tended to quicken rather than to lessen the heart's action was admitted. Yet there were some disorders which produced an opposite effect. For example, it was occasionally seen in (1) disease of the heart-walls; (2) obstruction of coronary vessels; (3) as a sequel of certain fevers and blood diseases; (4) in relation with diseases of the respiratory beat and mechanism; (5) as a manifestation of grave neurotic changes—epilepsy, traumatism, etc.; (6) in abdominal injuries and operations; (7) as the result of certain drugs and poisons.

SENILE CHOREA; MANIA; RECOVERY.

FERRIER (*Lancet*, 1891, No. 3538) records the case of a woman, aged seventy years, who had an attack of left-sided chorea in 1890. The present attack affected the right side and began at Christmas-time with a severe bilious attack, and was accompanied by great irritability of temper and sleeplessness.

On admission to hospital there was typical chorea of the right side. The thoracic and abdominal viscera were healthy. The same night the patient became acutely maniacal and had to be isolated and put into a straight waist-coat. She was taken home after three weeks in practically the same condition. About nine weeks later the chorea began to subside, and the condition of cerebral excitement rapidly passed off. The treatment consisted mainly in the administration of bromide of potassium, arsenic, and quinine.

ON THE TREATMENT OF INTUSSUSCEPTION BY INJECTION OR INFLATION.

MORTIMER (*Lancet*, 1891, No. 3534), while fully admitting certain obvious advantages, draws attention to some of the dangers of this plan of treatment. Inflation does not appear to be safer than injection. An even pressure should be employed in all cases to lessen the chance of exciting peristalsis and rupture. With a view to ascertain the limits of safety of the mode of treatment, post-mortem experiments were made on infants. It was found that when the resultant pressure distending the colon rose to two and a half pounds to the square inch (irrigator raised five feet) there was apt to be cracking of the peritoneum. In some cases there was complete rupture of the bowel at a slightly higher pressure (irrigator at six feet). The writer criticises adversely the conclusions of Dr. W. E. Forest, of New York, in regard to the amount of pressure which it is safe to use.

An interesting case is quoted in which post-mortem experiment was made on a case in which invagination had occurred during life. The subject was an infant aged three months, who presented the usual signs of acute intussusception. Inflation was performed with a Higginson's syringe and the tumor

gradually disappeared. The symptoms recurred after some hours and ended fatally. On examination the stomach and intestines were much distended; there was no peritonitis; the apex of the intussusception was below the splenic flexure. A tube was tied into the rectum and the irrigator raised to two feet. The intussusception was reduced in a few minutes with the exception of one inch; the end of the ilcum, the cæcum, and part of the vermiform appendix remaining tightly ensheathed by the colon. After fifteen minutes the irrigator was raised to three feet. A slight further reduction took place, but in four minutes the colon ruptured in three places just below the intussusception.

In another case, in a child aged eight months, about ten ounces of water were injected three times from an irrigator held at three feet, and on the two following days a pint of water was run in at a lower pressure. Post-mortem, three ruptures were found in the descending colon. The writer argues against inflation or injection as a prelude to laparotomy.

CEREBRAL SUPPURATION FOLLOWING INFLUENZA.

DR. J. S. BRISTOWE (*British Medical Journal*, 1891, No. 1592) reports two cases in which the patients were attacked two to three months before death with symptoms indistinguishable from those of influenza.

In the first case, that of a carman, aged twenty-four years, cerebral symptoms came on early and continued with variations and ingravescence to the end. In the second, that of a school-girl, aged fourteen years, headache was an early symptom, but it was only latterly that the symptoms indicated the presence of grave cerebral disease.

The facts which lead the author to conclude that the cerebral abscesses in these cases were referable to influenza are: (1) Acute onset with symptoms indistinguishable from those of typical influenza; and (2) That none of the usual causes of abscess of the brain were or had been present.

In Case 1 the abscess—the size of a small Tangerine orange—was situated in the upper part of the left hemisphere. There was no disease of the ear nor any other condition tending to throw any light on the origin of the abscess. In Case 2 the abscess—which was about the same size—was situated in the right occipital lobe and adjoining part of the sphenoidal lobe. The ears and frontal sinuses were quite healthy.

In an addendum Dr. Bristowe mentions briefly three other cases in which influenza terminated fatally with symptoms of cerebral disease which may have been due to suppuration.

THE SIGNIFICANCE OF CHEYNE-STOKES RESPIRATION AS A SYMPTOM IN CARDIAC DISEASE.

DR. M. A. BOYD reports a case of cardiac hypertrophy and dilatation with systolic aortic bruit in which Cheyne-Stokes breathing occurred, presenting several features of interest.

The phases of the respiratory phenomena observed were as follows:

(1) An apnoeal period characterized by deep sleep, lividity of face, quick pulse, feeble contractions of heart, perfect rest from all agitation, mental and bodily.

(2) An inspiratory period, with rousing of all the patient's faculties, extreme restlessness, slowing and strengthening of the pulse, apparently stronger contractions of the heart, less lividity of the face, and then a final deep inspiration.

(3) An expiratory period, with inspirations gradually getting shorter and expirations longer, pulse getting quicker and heart feebler in its contractions until expirations cease and the chest is empty, and restlessness gives place to sleep, which continues through the apnoea following.

The author lays stress on the variations in the pulse or cardiac rhythm during the different periods, and draws attention to the fact that though the respiratory effort during the ascending period is an inspiratory one, during the descending period of the effort it is chiefly expiratory. He is of opinion that the cardiac conditions necessary for the production of this form of breathing are not alone dilatation of the aorta, but also dilatation of the right ventricle with commencing degeneration or weakness of its walls; also hypertrophy of left ventricle with or without dilatation, but with degeneration of its muscle or enfeeblement from any cause, so that it is unable to empty its contents into a dilated and inelastic aorta.—*Dublin Journal of the Medical Sciences*, 1891, No. 235.

INFLUENZA EPIDEMIC OF 1889-90.

In the official Report just published, DR. PARSONS, who undertook the inquiry, tracks the general course of the epidemic from the northern hemisphere in a direction east and west, and it is explained that this took place mainly against the prevailing winds.

The theory of its relation to some Chinese inundations and of an aërially travelling miasm across the Asiatic and European continents is not borne out by the information procured; but, on the other hand, there is an abundance of evidence to show that it travelled mainly along the lines of human intercourse, attacking large towns and centres of population first, and that the disease travelled only just as fast as any humanly conveyed infection with a similar incubation period might have been expected to travel.

On the question of infection Dr. Buchanan, in his introduction to the report, writes: "Probably no evidence has ever been put on record in such abundance as that accumulated in Dr. Parsons' report, to show that, in its epidemic form, influenza is an eminently infectious complaint, communicable in the ordinary personal relations of individuals with one another. It appears to me that there can henceforth be no doubt about the fact."

Dr. Parsons does not appear to be impressed with the evidence in favor of the existence of any direct relation between influenza and the disease in horses known as "pink-eye."

Over-crowding and impure air must be regarded as having a powerful influence in developing the epidemic, whilst poverty and absence of warm clothing have largely conduced to the fatality of the disease.

The contagium of the disease does not appear to be of a very stable kind, and one characteristic of its instability lies in its uncertain and varying incubation period. Speaking generally, the evidence adduced points to a period of two to three days as the most common period of incubation, and to twenty-

that this stone was in the hepatic duct at the time of the operation, and subsequently passed into the common duct. A second operation was not performed, because, during life, it was supposed that the repeated attacks of obstruction were caused by a stricture of the duct, and not to obstruction by a stone.

SURGICAL TREATMENT OF DÉFORMITIES DUE TO PARALYSIS.

ADAMS (*The Lancet*, No. 13 of vol. ii., 1890, p. 653) discusses this subject in a lecture delivered at the National Hospital for the Paralyzed and Epileptic. He advises the use of massage and passive movements in the early stages of muscular contraction; in severe cases subcutaneous tenotomy. He points out the danger of making a large open wound when dividing the tendo-Achillis in cases accompanied by spasmodic rigidity. The assistant who has charge of the foot should be aware that in these cases the anterior muscles are sometimes thrown into violent spasmodic contraction as soon as the tendon is divided.

The general principles of treatment are:

1. Subcutaneous division of all the contracted tendons.
2. Gradual, rather than immediate, or rapid, mechanical extension.
3. Physiological means to promote the restoration of muscular power.
4. Mechanical supports adapted to the requirements of the case.

CHOLECYSTOTOMY.

Three cases of cholecystotomy are reported in the *Australian Medical Journal*, vol. xii., No. 8, p. 359. The first case is reported by C. S. RYAN. The patient had had an attack of jaundice seven years before the operation, and since then had suffered with pain in the region of the gall-bladder. A distinct pear-shaped tumor could be felt in the region of the gall-bladder. Cholecystotomy was performed, and a large stone was found impacted in the common duct. The gall-bladder was stitched to the abdominal incision. The patient made an uninterrupted recovery. The reporter calls attention to the fact that Mr. Tait divides all cases of enlarged gall-bladder into two clinical divisions: first, those cases which are not accompanied by jaundice, when the obstruction is in the cystic duct; and secondly, those cases in which there is a multiple collection of stones, usually accompanied by jaundice. The case just reported belonged to the first class. The prognosis in the second class is naturally more grave, on account of the greater systemic disturbance caused by the jaundice, and also on account of the altered condition of the blood, which leads to hæmorrhage.

The second case is reported by W. MOORE. The patient had suffered for seven years, dating his sickness from a fall from a buggy, the wheel of which passed over his body in the region of the liver. He had had several attacks of jaundice, during one of which the operation was performed. The gall-bladder was found to be much distended with fluid; the liquid contents were removed by the aspirator, and 170 small gall-stones of varying size and shape were removed by the finger and a lithotomy scoop. The gall-bladder was stitched to the abdominal incision. The patient died in two days of septic

injections occasioned no general reaction, but in certain cases, especially in those with fever, profuse perspiration followed, succeeded in turn by a sense of comfort and a lowering of temperature. In exceptional instances abdominal pain and diarrhoea developed in the course of treatment, but subsided on suspending the injections. In three cases of advanced phthisis, in which death took place, the changes found in the lungs were indicative of a reparative tendency. The tubercles presented an appearance of beginning fatty degeneration; the cavities were clean and dry. In one case the ulcers in the intestine showed a disposition to cicatrization. Neither in the lungs nor elsewhere was there any evidence of a fresh eruption of tubercles as a result of the treatment. In the remaining cases of phthisis the cough diminished, the sputum became less, and the number of bacilli in the sputum smaller, the body weight increased, the night-sweats disappeared, the general condition improved, and the physical signs receded. In the cases of pleurisy the results were equally good. Effusion speedily disappeared, and recovery was rapid.

DIABETES AND VASCULAR SCLEROSIS OF THE PANCREAS.

LEMOINNE and LANNOIS (*Arch. de Méd. expér. et d'Anat. pathol.*, 1891, No. 1) made a study of the pancreas in four cases of diabetes: three of these belonged clinically to the so-called pancreatic type; one was in a case of long standing. In the last, the liver and kidneys presented alterations similar to those found in the pancreas. In the other three the liver contained several limited areas of interlobular sclerosis not involving the hepatic lobules; the kidneys presented no lesion; the pancreas, however, presented marked changes. In all, the lesions of the pancreas were topographically the same. Sections of pancreatic tissue, hardened in Müller's fluid and stained with hæmatoxylin or carmine, exhibited interacinous and intercellular sclerosis—a true interstitial pancreatitis—having for its point of departure the vascular system and notably the venous and lymphatic system of the gland, and giving rise to consecutive degeneration of the cellular elements. This differs from the conditions found after ligature of the duct of Wirsung, in that the dilatation of the duct is followed by its fibrous transformation, the vascular sclerosis appearing late and as an accessory phenomenon. In the cases in which the pancreatic duct has been ligated the absence of sugar in the urine has been expressly noted. These facts give support to the opinion of M. Lepinc that the pancreas, like the liver, has a double function. The liver elaborates not only bile, but also glycogen; the pancreas separates not only trypsin, amyl-opsin, and steapsin, but also a glycolytic ferment—the first three at the free extremity of the cell, the last at that pole of the cell in relation to the vascular supply.

HEMIATROPHY OF THE TONGUE OF PERIPHERAL ORIGIN.

Before the Canadian Medical Association, at Toronto, BIRKETT (*Montreal Medical Journal*, 1891, No. 9) reported a case of hemiatrophy of the tongue of peripheral origin. The patient, a bank clerk of twenty-three, nine years

four hours on the one hand, and to some four days on the other, as fairly common extremes.

The poison may find admission into the system through the lungs, but Dr. Bezly Thorne, whose views are quoted at length in the report, is of opinion that the conjunctiva is the structure which the infecting material or microbe most generally, if not always, attacks.

THE PRACTICAL ELECTRO-THERAPEUTICS OF GRAVES'S DISEASE.

H. W. D. CARDEW, M.R.C.S. (*Lancet*, 1891, No. 3540), is of opinion that many cases in which drugs have proved valueless are amenable to electrical treatment.

For this purpose galvanism is superior to faradism. A very weak current (two to three milliampères) is sufficient. Each application should last six minutes and frequent applications (three times a day) should be made. The anode should be placed on the nape of the neck, the centre of its lower border corresponding to the seventh cervical spinous process, and be firmly held in that position during the application. The kathode should be moved up and down the side of the neck from the mastoid process along the course of the great nerves. The application is followed by a reduction in the frequency and force of the heart-beat, prolongation of the diastole being most marked. The slowing of the pulse-rate does not usually last for more than half an hour. The diminution in violence of beat lasts longer. As the case progresses and improves these effects become permanent.

THE TREATMENT OF TUBERCULOSIS BY MEANS OF SUBCUTANEOUS INJECTIONS OF EUCALYPTOL, GUAIACOL, AND IODOFORM.

PIGNOL (*Compt.-rend. hebdom. des Séances de la Soc. de Biol.*, 1891, No. 10) reports that for three years he has applied eucalyptol, alone or in combination with iodoform and creasote or guaiacol; guaiacol and iodoform, without eucalyptol; and creasol and guaiacol, subcutaneously, in the treatment of tuberculosis, with most satisfactory results. He uses as a menstruum sterilized liquid vaselin, olive oil, or oil of sweet almonds—preferably one of the latter two—containing twenty per cent. of the medicaments in varying proportions, of which at least from three to ten cubic centimetres are injected daily. The injections are made with antiseptic precautions into the retro-trochanteric fold. The best results were obtained from a combination of guaiacol and iodoform.

PICOT (*Bull. de l'Acad. de Méd.*, 1891, No. 9) has reported the results of treatment in twenty-five cases of pulmonary tuberculosis and eight of pleurisy by means of subcutaneous injections of iodoform and guaiacol, dissolved in sterilized olive oil and vaselin, each cubic centimetre of the solution containing one centigramme of iodoform and five of guaiacol. The injections, each of three cubic centimetres, were made into the supra-spinous fossa daily, and were unattended with unpleasant local results. As an evidence of the absorption of the medicaments, the presence of iodoform could be demonstrated in the urine, guaiacol not being eliminated by the kidneys. As a rule, the

MORVAN'S DISEASE.

CHURCH (*Journal of the Amer. Med. Association*, 1891, No. 10) reports a case of so-called Morvan's disease, with a brief review of what is known on the subject, the literature of which is scanty. The affection is characterized by a destructive process, progressively and symmetrically involving the digits, ulceration with exfoliation of bone taking place, and resulting in deformity, sometimes preceded by pain and attended with anæsthesia. In the only case of the disease in which an autopsy has been reported, an excess of connective tissue was found in the posterior horns, posterior columns, and gray matter of the cervical cord and in the peripheral nerves. Nothing is known as to its etiology. The disease is to be distinguished from scleroderma, anæsthetic lepra, symmetrical gangrene, and syringomyelia. The treatment is symptomatic.

CONGENITAL OCCLUSION OF THE ŒSOPHAGUS; COMMUNICATION BETWEEN THE TRACHEA AND ŒSOPHAGUS.

GRANDOU (*Bull. de la Soc. Anat. de Paris*, 1891, No. 3) reports the case of a newborn infant, which, applied to the breast several hours after birth, took the nipple without difficulty. Each time it nursed, however, the infant became congested and purple; it then abandoned the breast, and almost immediately vomited the milk it had taken. Efforts at feeding with a spoon and gavage were no more successful. Death took place on the sixth day. On examination the superior portion of the œsophagus was found to be normal; lower down was a dilatation an inch and a half in length, below which the œsophagus was replaced by a firm cord, two-thirds of an inch long and a quarter of an inch thick, adherent in front to the trachea. Beyond this the œsophagus resumed its calibre for a distance of a little more than two inches, at its termination emptying into the stomach. Opening the trachea from in front an orifice with bevelled edges, the plane of which looked upward and forward, was found on the posterior wall, a little more than an inch below the cricoid cartilage. This orifice communicated with the lower portion of the œsophagus and through it the mucous membrane of the trachea was continued.

PARTIAL NEPHRITIS.

CUFFER and GASTOU (*Revue de Médecine*, 1891) describe as partial nephritis a condition succeeding the acute or active manifestations of a renal lesion, in which a fixed and invariable amount of albumin is present in the urine, although the patient is in all other respects in perfect health. Five cases illustrative of the condition are cited. Pathological evidence is wanting, but an analogy is made with the lesions found in amyloid disease, in arteriosclerosis, and in plumbism, in which diseased and healthy structure alternate or the disease is less decided at one part than at another. The condition must be considered not as a disease, but as an infirmity, for which treatment is useless and may prove hurtful. It is important, however, for the patient to avoid those influences which are known to affect the kidneys injuriously.

previously, following an attack of mumps, noticed a large and painful swelling behind the angle of the jaw on the right side. Subsequently there was some difficulty in speech, and the tongue, when protruded, deviated to the right. Five years later it was observed that pressure upon the swelling led to flushing and sweating on the right half of the face and to a sense of dryness of the throat. At the time the patient came under observation, when the mouth was opened, the tip of the tongue pointed to the left, but when the organ was protruded, the tip deviated to the right. The right half of the tongue was smaller than the left, and presented reactions of degeneration, but there was no fibrillary contraction, and the sense of taste was unimpaired. There was paresis of the right half of the soft palate, and the mucous membrane of the fauces, soft palate, and walls of the pharynx were insensible to titillation. Sensation, however, was unimpaired at the posterior extremities of the inferior and middle turbinated bones and on the lips and mucous membrane of the mouth. The right vocal band occupied the cadaveric position, scarcely moving in abduction and adduction. Movement of the right half of the epiglottis was defective. The pulse was ninety-six in the minute. The pupil was smaller and the palpebral fissure narrower on the right than on the left. Vision was myopic—on the right by 1 D.; on the left by 0.25 D. From a careful study of the case Birkett believes the lesion to be peripheral, the result of inflammatory changes in and about a cervical gland behind the angle of the jaw and involving the hypoglossal, the vagus, and the accessory nerves, the pharyngeal plexus, and the superior ganglion of the cervical sympathetic—all on the right side. The following deductions are made:

1. The hypoglossal is the motor and trophic nerve of the tongue; 2, the glosso-pharyngeal nerve is concerned in the function of taste; 3, branches of the pharyngeal plexus supply the mucous membrane of the naso- and buccal pharynx with sensory fibres; 4, the motor nerve of the levator palati and azygos uvulæ muscles is probably the accessorius; 5, the superior ganglion of the cervical sympathetic contains (a) dilator fibres to the iris of the same side; (b) vasomotor fibres; (c) sweat fibres; and (d) secretory fibres to the mucous glands of the pharynx.

PULMONARY ABSCESS.

In a paper read before the St. Louis Medical Society, PORTER (*Journal of the Amer. Med. Association*, 1891, No. 10) expressed the view that pulmonary gangrene or abscess following embolism is not necessarily multiple; that gangrene may follow embolism of a pulmonary artery; and abscess, embolism of a bronchial artery. When the products of disorganization can be readily discharged, with the probability of cicatrization taking place, operation may be deferred; but when there are evidences of rapid breaking down, when fever, restlessness, and depression are marked, prompt and active measures are indicated. When the abscess is extensive and operation necessary, Porter prefers to excise a large piece of rib over the cavity and make a free opening in the pleural sac. A smaller incision may be made in the lung. Two cases of gangrene, successfully operated upon in the manner indicated, are reported.

disturbances and the direction of the external wound in his case, he diagnoses a partial severance of the anterior column and the anterior part of the lateral column on the right side. Therefore, he maintains that it is not possible that the lateral columns in the cervical cord carry both sensory and motor fibres, since in his case there were absolutely no disturbances of sensation.

Dr. Bode cites several cases of perfect healing of wounds of the spinal cord involving not quite half its diameter, which were recognized during life to be wounds of the cord, or were subsequently clearly demonstrated at the autopsy by the cicatrices.

He goes on to explain that the appearance of symptoms which set in generally on the second to the third day after the wounding, and which might easily be mistaken for traumatic myelitis, is due to what Schiefferdecker describes ("Ueber Regeneration, Degeneration, und Architektur des Rückenmarks," *Virchow's Archiv*, Bd. lxii.) as traumatic degeneration following wounds of the spinal cord, and setting in on the second to the third day. The degeneration begins as a disintegration of the elements of the nerves into glossy flakes. This process extends from the cut surfaces about four to six millimetres above and below. Hence, in the case of wounds in the neighborhood of the fourth cervical vertebra, although the phrenic nerve be not at first implicated, yet at the end of the second or third day that complication may arise.

The increase of the reflex excitability, Dr. Bode explains as due to what Schiefferdecker describes as secondary degeneration, which manifests itself about the fourteenth day, and which, by cutting off the influence of the reflex inhibitory fibres running down the lateral columns in the cervical cord, gives rise to an increase in the reflexes. Schiefferdecker describes a third form of degeneration, which he calls cavity formation, and to this Dr. Bode ascribes the fibrillary tremors in the limbs formerly paralyzed.

Retention of urine and feces is not uncommon following wounds in this region. The organs either return to normal, or else incontinence sets in. The height of the wound has no influence hereon. Priapism almost always occurs where there is vasomotor disturbance. Elevations of temperature are not found on the anæsthetic areas of the skin, if there be any, but only on the areas where there is motor paralysis. This proves that the vascular nerve-supply runs down the same paths as the motor fibres. Dr. Bode cites a very interesting case where he found variations of temperature of the affected part entirely independent of the temperature variations in the rest of the body.

He maintains that it is impossible to locate with absolute certainty the position of the wound on the cord from the symptoms, since some hemorrhage affecting the parts immediately adjoining is inevitable, and, furthermore, unless the assailant's knife be very sharp, it must make more or less of a contusion on the cord before it cuts through the elastic pia mater.

To sum up, the most conclusive symptom is a sharply defined paralysis below the point of wounding, coming on at the moment the wound is received.

As to treatment, he says the external wound should be enlarged and left open. Above all, free drainage should be encouraged, even to the loss of

The prognosis is not grave if appropriate precautions are taken. The conclusions formulated are that persistent albuminuria is a result of a past nephritis, in the chronic stage, and that the persistence of a fixed amount of albumin in the urine, incapable of diminution, is evidence of a partial nephritis.

SURGERY.

UNDER THE CHARGE OF

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STAB-WOUNDS OF THE SPINAL CORD.

DR. OTTO BODE (*Berliner klinische Wochenschrift*, Jahrg. xxviii., No. 22) gives an interesting account of the diagnosis, course, and proper treatment of stab-wounds of the spinal cord. He cites the case of a man who, in a street fight, received several wounds on the head; on the back of the neck there was one about five centimetres long, running obliquely down to the spinal column and exposing at its bottom the atlas and axis. At the moment of wounding the patient fell to the ground, lost consciousness for only a minute, but remained paralyzed on the right side below the point of wounding. When called upon the right lower extremity responded slowly and reluctantly, but for walking or standing was weak and useless. There were no areas of anæsthesia, nor any disturbance of the special senses. The bladder and rectum were normal; priapism not present. The muscles of respiration on the right side were decidedly implicated. The faradic excitability of the muscles remained normal. For three weeks this condition continued apparently unaltered. At the expiration of this time the patient began to gain more and more use of the paralyzed limbs, albeit at the same time the reflexes became greatly exaggerated, and at the least touch the muscles jerked. The patient was under observation for three months; the paralysis was practically gone, and even the reflexes had returned to normal, and in a year's time no evil effects of the wound remained, save at times a slight tremor in the muscles which had been paralyzed. The wound was treated solely by the antiseptic dressings.

From the anatomical relations of the vertebræ and their ligaments, Dr. Bode proceeds to show that in the cervical region when the neck is bent down, as it usually is when a man receives a wound there in a fight, the cord can be wounded at almost any point of its circumference, or, indeed, may be wholly severed, without injury to the vertebræ. From the motor

states that he has without extreme haste done lateral anastomosis by this method, including tying off the mesentery and excising several inches of the gut, in half an hour, counting from the first incision into the belly-wall to the knotting of the last parietal suture. He claims as original: the material from which he makes his plates; his method of inserting the plates and making the anastomotic opening; his method of suturing; his method of denuding the peritoneum by means of the knife-blade, and his method of protecting the suture at the plate-ends by causing adhesion of the blind ends of the adjacent bowel. To those who have had much experience in laboratory work, the technique described would in some points commend itself.

UNION OF THE DIVIDED ULNAR NERVE BY PLASTIC OPERATION.

DITTEL (*Wiener klin. Wochenschr.*, Jahr. iv., No. 18) reports a successful plastic operation upon the ulnar nerve, although there was considerable loss in the continuity of this structure. The patient received a severe wound of the arm, which, together with extensive injury to the skin and muscles, destroyed about two and a half inches of the ulnar nerve. The peripheral end of this nerve could not be found. The wound was closed under antiseptic precautions. Examination on the following day showed that the sensibility of the skin supplied by the ulnar nerve was practically unimpaired, and that there was very slight difference in the muscular power of the right and left arm. This was evidently due to nervous anastomosis. Four weeks later an electrical examination showed that the muscles supplied by the ulnar nerve were completely paralyzed. By no form of current could contraction be induced. An operation for the restoration of the continuity of the nerve-trunk was at once undertaken, since it seemed desirable to accomplish this before marked degenerative changes could set in. By careful dissection the proximal and peripheral ends of the nerve were exposed. About three inches from the extremity of the peripheral nerve-end a thin-bladed scalpel was thrust directly through the centre of its trunk; by carrying the blade upward the trunk was split in two equal halves. The incision stopped short before reaching the extremity of the nerve. In a similar manner the proximal end was split. By transverse cuts half the nerve was freed and carried upward from the distal end, downward from the proximal end, until the extremities of the ends thus split off were brought in contact. Sutures were applied. To cover the large defect of the soft parts resulting from the original injury, a flap of skin was transplanted from the upper portion of the arm. Suppuration set in. The wound was dressed by the open method. Eight weeks after operation an electrical examination was made as to the condition of the muscles supplied by the ulnar nerve. The results were negative. Two weeks after this, however, the muscles reacted to electricity. At the time of reporting the case contractions could be excited, not only by application of the current to the muscles, but also by excitation of the nerve-trunk.

BRENNER (*Ibid.*) also reports a successful neuroplastic operation ten years after injury to a nerve.

The patient exhibited a bluish discoloration and decided emaciation of the left index and middle fingers, the nails of which were thickened and turtle-backed. Both fingers were flexed at the metacarpo-phalangeal articula-

meningeal fluid, and the blood and secretions of the wound should be kept aseptic. Finally, the wound should be allowed to heal by granulations, or sewn up secondarily.

INTESTINAL ANASTOMOSIS BY MEANS OF VEGETABLE PLATES.

After reviewing the well-known objections to all the mechanical arrangements designed to accomplish intestinal anastomoses, DARBON (*Medical Record*, vol. xxxix. No. 26) states that he has discovered what may be called an entirely serviceable emergency plate in one made from a raw potato. He has experimented on a large number of dogs, and so far as this work goes has evidently well proven not only the reliability of his plates, but the value of certain modifications he has made in the operation of intestinal anastomosis. A pair of the potato plates can be made by his method in ten minutes. The material can always be procured. It has no tendency to swell; it is rigid, and remains so longer than the majority of other materials devised for this purpose. For use upon the human gut the plate should be made about one-third of an inch in thickness, and should be cut so long that the opening is about twice the normal diameter of the gut to be operated upon. To prevent the threads from cutting through they should be very coarse, and the needle before passing through the plate should traverse a scrap of rubber drainage-tube or a minute bit of cloth, which, by its broad surface, prevents the large knot tied on the end of the thread from pulling through. Instead of first making the incisions into the gut, which subsequently serve as the artificial opening, the plate is inserted into the lumen of the bowel through its divided end and the needles are made to traverse the gut-wall at their proper positions. When the two plates are thus placed in the two extremities of the bowel, at least two inches from the cut extremity, the corresponding threads of the two plates are tied together, thus apposing the two peritoneal surfaces covering the plates. These surfaces previously should be well scraped with a knife, so that prompt adhesions may take place. After the plate-threads are tied, at least one line of sutures should be run around the plates, great care being taken not to pass the needle into the lumen of the bowel. The author prefers a basting-stitch, since it is easier to apply, employing three stitches to the inch. When these stitches are placed, into one open gut-end a strip of wood is passed; this is for the purpose of cutting against; the opening is then made through the apposed gut-walls enclosed by the rings. To do this a scalpel is inserted into the open end of the gut, and as long an anastomotic opening is made as the plates will allow. The strip of wood prevents cutting too deeply. After this incision is made, water should run freely into one end and out of the other. Under gentle hydrostatic pressure, closing the outlet end with the finger and thumb for a few moments, the line of suture should not leak if properly made. The free ends of the bowel are next scraped, inverted, and secured in this position by a double line of running sutures.

Finally, a stitch or two is taken between the blind ends and the gut against which each rests, first scraping the peritoneal surfaces which are apposed. This prevents the possibility of another loop forcing its way into this angle with the result of undue tension of the stitches at the plate-ends. The author

There is also a certain rare form of chancre which produces lesions very like the circinate erosive balanoposthitis: this is the epithelial phagadenic chancre, manifesting itself in the form of an erosion which may extend over the greater part of the glans penis.

The treatment of erosive circinate balanitis consists in destroying the epithelial cells—the breeding-ground of the parasites which occasion the disease. This is best accomplished by nitrate of silver, bichloride of mercury, or strong solutions of carbolic acid. Other antiseptics are of little value.

DUPUYTREN'S CONTRACTION.

In a series of lectures delivered upon the contraction of the fingers and toes, ANDERSON (*The Lancet*, 1891, vol. ii. No. 2), after a careful study of the pathology and treatment of true and false Dupuytren's contraction, arrives at the following conclusions:

There are two forms of disease comprised under the name of "contraction of the palmar fascia," the one traumatic in origin, dependent upon changes in the integumental and fascial structures, and occurring at all ages; the other unassociated with obvious traumatism, tending to multiplicity of lesion, and almost confined to middle or advanced life.

The latter condition, true "Dupuytren's contraction," is not, strictly speaking, a contraction of the palmar fascia, but consists of a chronic inflammatory hyperplasia, commencing in the subcutaneous connective tissue and involving secondarily the palmar fasciæ and the deep fibres of the corium. The morbid bands are, for the most part, formed at the expense of the normal tissues.

This condition does not appear to be connected primarily with pressure or friction of the palm by tools or other objects employed in manual occupations, but is probably due to a specific infective agent which effects its entrance through epidermic lesions made by the finger-nails, or otherwise.

It is almost essentially a disease of advanced and middle age, more common in men than in women, occurring in all classes, tending to progress slowly through a long course of years, and to return after operation.

It is connected with a special diathesis, inherited or acquired, which cannot yet be expressed in any known terms; but neither gout, rheumatism, rheumatoid arthritis, nor any other of the ordinary constitutional ailments has been shown to have any causative relation to the disease.

It appears to be almost, if not quite, unknown in certain parts of the East, as in India and Japan.

THE MICROÖRGANISMS OF THE NORMAL URETHRA.

Since Lustgarten and Mannaberg stated that in the healthy urethra of man were constantly to be found microörganisms which in form, grouping, and color reaction closely resemble gonococci, much discredit has been thrown upon the reliability of this latter microbe as an indicator of the presence of true gonorrhœa in any given urethritis.

PETIT and WASSERMANN (*Annales des Maladies des Organes Genito-urinaires*, 1891, Tome ix. No. 6), in a series of carefully conducted researches, both microscopic and bacteriological, failed to find in any case the microörganisms

tions; tendons and joints were found to be normal on manipulation. The palmar surface of both these fingers and the ulnar surface of the thumb were completely anæsthetic; the other portions of the skin of the hand were normal. Ten years before, the patient had received a stab-wound on the flexor surface of the wrist-joint. The scar of this wound lay directly over the course of the median nerve; beneath it there was a hard knot the size of a cherry; this often occasioned great pain. It was diagnosed as a neuroma, and excision was determined upon. On dissecting this tumor free, it was found attached to the extremity of the central portion of the median nerve. On dividing this connection, the cross-section of the nerve seemed perfectly healthy. It was then determined to find the distal end of the nerve and restore the continuity of this structure by a plastic operation. The two extremities of the nerves were split almost to their terminations. The halves of the split trunk were freed at the points most distant from the terminations of the nerve; the flaps thus formed, made long enough to completely bridge the gap existing between the nerve-ends, were turned down and up, respectively, and were sutured to each other and to the freshened extremity of the two nerve terminations. The wound was closed, and healed by primary intention. Two weeks after operation there was return of sensibility. A year later sensibility was completely normal, and the contracture of the fingers was no more observable. The trophic disturbances, however, did not disappear.

EROSIVE BALANO-POSTHITIS.

An erosive circinate form of balano-posthitis, quite different from the ordinary type of the disease so often observed complicating gonorrhœa, is described by BERDAL and BATAILLE (*La Médecine Moderne*, an. ii. No. 22). They find that there is a distinct inflammation of the epithelial covering of the foreskin and glans penis, characterized by the facts that it is inoculable and contagious; that it is not secondary to irritation, but is essentially primary and due to a microbe; that it has a definite course, starting in one or more erosions and extending centrifugally in circinate lesions; that these lesions are circumscribed by white, friable borders; that there is a very free purulent secretion in which spirilla can be found, and that this inflammation occasions lymphadenitis and polyadenitis. These are all characteristics sufficiently distinct from the salient features of ordinary balano-posthitis, which is neither inoculable nor contagious, is always secondary to mechanical or chemical irritation, has no definite course, begins not as an erosion, but as an area of acute hyperæmia, has little tendency to spread, and rarely produces extensive lesions.

Certain cases of herpes at times closely simulate the erosive circinate form of balano-posthitis; but in herpes the white, friable margin is wanting to the lesions, and, as Leloir has shown, on pressing an herpetic erosion between the fingers there is a free exudation of serum. This is not the case in circinate balano-posthitis. Mucous patches may so closely simulate the form of balano-posthitis described as to render a differential diagnosis impossible until sufficient time has elapsed to determine the nature of the disease from its clinical course.

peritonitis. The case was an unfavorable one for operation on account of the long duration of the illness, and the repeated attacks of jaundice.

The third case is reported by MR. BALLS-HEADLEY. The patient had suffered for seven months before operation with a tumor in the right hypochondrium, and dragging and aching pains. She had not had jaundice. Examination showed a fluctuating and freely-movable tumor in the region of the gall-bladder. The abdomen was opened and six ounces of dense bilious fluid were removed by a trocar. The opening in the gall-bladder was then enlarged, and the cavity was explored by the finger. The walls of the gall-bladder were stitched to the abdominal walls, and twenty-five gall-stones were removed with the finger and forceps. A remaining stone was felt high up, under the right ribs, impacted in the cystic duct. It was found impossible to remove this stone. The patient recovered without difficulty. The biliary fistula, however, remained opened, and eight months after operation it was still discharging about half an ounce of clear mucus a day, and the stone could be felt by a probe to be in the same place.

In the discussion which followed the reports of these cases the question was raised between cholecystectomy and cholecystotomy. Mr. Lawson Tait, from his own personal experience, is strongly in favor of cholecystotomy.

RESULTS OF THE TREATMENT OF HIP-JOINT DISEASE BY THOMAS'S SPLINT.

RIDLON (*New York Medical Journal*, vol. lii., No. 14) communicates the results of his observations upon 62 cases of hip disease treated by Thomas; these cases were seen during a twelve-days' stay at Liverpool, and represent rather a picture of Thomas's daily work than of the final results of treatment. Of the observed cases the average duration of limp before treatment was commenced was a little over ten months. Contrary to what is generally believed, it was found that the long splint—that is, the one extending from the lower angle of the scapula to the lower third of the leg—had not always been put on at the beginning of treatment, but that the short splint which does not lock the knee had been used instead. In some cases the short splint had been replaced later by a long splint, but in others its use had been continued throughout the entire course of treatment. Nearly all the patients were found walking around without the high shoe and crutches, and it was common to allow patients to walk before deformity had been overcome, and while muscular spasm and deformity, and sometimes pain, still persisted. Of the 58 patients who had been under treatment for a longer or shorter time 23 had at some period of their course, some before, but many after treatment had been commenced, suffered from abscesses. Of these, one had disappeared without opening, and another was undergoing rapid absorption. There were 27 cases which were either cured or were so well advanced in convalescence that it was not thought dangerous to test mobility thoroughly. Of these, 12 had no motion, 10 had slight motion, 2 had motion of 90 degrees, and 3 had normal motion. It is, of course, impossible to formulate conclusions after a short observation of comparatively few cases, but Ridlon states as his general impression that very many of the patients who have had the short splint applied before muscular spasm and pain had subsided and before

characterized by Lustgarten as pseudo-gonococci. They found a number of bacilli, micrococci, and sarcinæ, which they believe are saprophytes—that is, are accidental hosts, and which vary in accordance with the nature of the soil in which they grow. In 1000 examinations they failed to find pseudo-gonococci. Frequently, however, they observed sarcinæ, which on superficial examination might well be taken for gonococci. These, however, are not decolorized by Gram's method; there are also certain sarcinæ which are readily decolorized by Gram's method, but they are so much larger than the gonococci that they cannot readily be confounded with the latter.

Steinschneider has long since shown that it is not alone upon one feature that the gonococcus is to be recognized, but upon the facts that these organisms are grouped around nuclei in the interior cells, are decolorized by Gram's method as formulated by Roux, and are recolored by Bismarck brown or by Loeffler's blue.

In summing up the results of their experimental investigation, the authors state that the normal urethra is always inhabited by various organisms; that the same varieties are not found in different urethræ; that different varieties are found in the meatus and in deeper parts of the canal; that none of the varieties found in the healthy urethra are pathogenic, and that the greater number of microorganisms of the normal urethra decompose urea.

OPHTHALMOLOGY.

UNDER THE CHARGE OF

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AN EXPERIMENTAL STUDY OF THE INFLUENCE OF THE RETINAL AND CHOROIDAL CIRCULATION ON THE NUTRITION OF THE EYE, PARTICULARLY THAT OF THE RETINA, AND OF THE CONSEQUENCES OF SECTION OF THE OPTIC NERVE.

Under the above title DR. WAGENMANN contributes a long paper which occupies 120 pages of the last number of the *Archiv für Ophthalmologie*, xxxvi.

H. 4. The investigation was undertaken at the instigation of Prof. Leber.

The experiments, which were made on rabbits, gave the following results:

1. Section of the optic nerve above the entrance of the central artery produced at first practically no alteration in the ophthalmoscopic image. Afterward a pallor of the disc became visible, and in the course of some weeks atrophy of the nerve bundles. After this lesion the circulation in the retina remains unchanged, but the retina shows a slight grayish veiling owing to

loss of transparency. The degeneration and disappearance of the nerve fibres can be followed anatomically. The degeneration spreads to the ganglion cells, but so slowly that well-preserved cells are to be found even after six months.

2. Section of the optic nerve with its vessels produces an immediate pallor of the papilla, a narrowing of the vessels, and disappearance of their blood-column. Generally, after the lapse of a week or two, there is an imperfect restitution of the circulation in the retina. This is effected by means of newly formed vessels springing from the choroidal ring, from the nerve-sheath, and from the episcleral ciliary vessels. The section of the retinal vessels is not followed by any opacity of the retina. The subsequent changes in the nerve are in no way distinguishable from those which take place after section of the trunk above the point of entrance of the central vessels.

3. Section of the long and short posterior ciliary arteries on the one side produces a rapid degeneration of all the corresponding layers of the retina. This shows itself at first ophthalmoscopically, and a few hours after the lesion, as a grayish retinal opacity. The nerve fibres above are relatively but little involved. Owing to the reestablishment in a few days of the choroidal circulation a complete degeneration of the one side does not take place. Thus, on microscopic examination, the most varying degrees of degeneration are found in close proximity to each other. The outer layers suffer most severely. A subsequent migration of pigment takes place into the degenerated portion of the retina.

4. Section of the optic nerve and its vessels, and at the same time of the ciliary vessels of one side, leads to a rapid degeneration of the nerve-layer of the retina on that side, the same layer on the other side only atrophying slowly.

5. Section of the optic nerve and vessels and all of the ciliary vessels causes a rapid degeneration of the whole eye.

The author admits that one cannot unreservedly apply the inferences as to the sources of the nutrition of the retina to which these experiments on rabbits must lead, to the case of man. He points out in particular that whilst the division of the retinal vessels alone did not cause any opacity of the rabbit's retina, the sudden removal of the blood supply caused by embolism of the central artery in man is invariably accompanied by a marked opacity. There is this difference, however, that the veins are not blocked in the latter case, and although no case of fresh embolism has as yet formed the subject of microscopical examination, it is highly probable that the opacity met with is merely an œdema. In other respects, viz., in recovery of transparency by the retina and in the absence of any subsequent pigmentation, the condition of embolism in man is in accord with the experimental result on section of the vessels in the rabbit. Anatomically, too, it has been found that as the result of embolism the nerve-fibres and ganglion-cells slowly disappear.

ON THE CORTICAL VISUAL CENTRE IN MONKEYS.

MAZZA has studied this question in the Physiological Laboratory at Genoa (*Annali di Ottalmologia*, xix. 6). He was struck by the fact that no previous experimenters had taken proper precautions to examine the field of vision.

After several attempts he succeeded in devising a plan which forced the animal to make use of direct fixation. This consisted in fixing a shell in the shape of an artificial eye, but perforated by a central aperture in the conjunctival sac in front of the eye. These shells were modelled from wax and caoutchouc. With such a shield, which had only a limited movement, in front of the eye, if the animal saw anything out of the direct line of vision one could feel sure that it did so with a peripheral portion of the retina. The experiments were made with a regular perimeter, the animal being fixed by means of a specially constructed apparatus. Removal of the cortex cerebri of the angular gyrus only produced a temporary concentric restriction of both fields of vision. Removal of the cortex of the occipital lobe produced a persistent hemianopia.

ON THE VALIDITY OF WEBER'S LAW IN THE CASE OF THE LIGHT-SENSE.

DR. SCHIRMER, by modifying the details of the usual method of testing the light-sense, has been able to show that Weber's law holds good with reference to this as well as to other senses. The light-sense referred to is what is now generally called the light-difference perception, or L. D.—*i. e.*, the extent of the power of distinguishing luminous impressions of different intensities. The statement of Weber's law is that "appreciation of the difference of two similar excitations of different magnitudes is not dependent upon their actual but upon their proportional differences." Former experimenters, and notably Aubert and Helmholtz, have denied the validity of this law in the case of the light-sense. Schirmer points out that the discrepancies between the results of these experiments and Weber's law are due to their not having taken into consideration the necessity for allowing for the adaptation of the eye for different light intensities. His own experiments, after providing for adaptation and performed with an ingenious modification of Masson's disc, led to the following results:

1. Weber's law is valid for the light-sense within a range of illumination of from one to one thousand standard candles at the distance of a metre from the illuminated surface. The eye must be allowed its full power of adaptation: so that the validity of the law is subject to the fulfilment of certain physiological conditions.
2. Physiological adaptation alone is capable of explaining why Weber's law should hold good, but Schirmer's experiments do not exclude the possibility of the participation of a certain psycho-physical process (such as Fechner assumed) in bringing about the result.
3. The adaptation of the normal eye does not all along keep pace with the diminution of daylight as dusk comes on.

AN EXPERIMENTAL STUDY OF THE NUTRITION OF THE CRYSTALLINE LENS AND THE DEVELOPMENT OF CATARACT.

By examining the first stages in the development of artificial cataract in the lenses of living rabbits, by the method of magnification with a strong glass lens behind the ophthalmoscope mirror, MAGNUS (*Archiv f. Ophthalmologie*, xxxvi. 4) has been able to throw some light on the process by which

the crystalline lens is nourished, and to make some valuable suggestions regarding the etiology of idiopathic cataract.

The artificial forms of cataract studied were those produced by the internal administration of naphthalin, sugar, and salt.

One dose of three to four grammes per kilometre of body weight given to not too young a rabbit is sufficient to give rise to changes in the lens after six hours. According as it was desired to produce a greater or less degree of opacity this was repeated more or less often. The lenticular changes made their appearance always before any visible changes occurred in the fundus. Although both lenses usually show the changes about the same time, they are occasionally to be found well marked in the one while the other remains perfectly normal. Two distinct phases are to be distinguished in these changes.

In the first there are to be seen a number of transparent bands, in the second well-marked and progressive opacities. They both begin at the equator of the lens, and apparently the very first traces are met with in two zones, the one lying immediately behind and the other immediately in front of the equator.

A characteristic feature of naphthalin cataract is that the opacities are capable of clearing up, and do so invariably if the naphthalin be stopped after only two doses have been given. Even a well-marked opacity of this nature occupying the whole extent of the superficial layers of the posterior cortex may entirely clear away. The clearing up always takes place in exactly the same manner, proceeding from the equator and posterior pole.

*As the recovery of transparency can only well be supposed to be due to the return to its normal condition of the nutrient fluid of the lens, the nature of the clearing process affords, Magnus argues, important conclusions as to the places of entrance of these fluids into the lens. It is thus rendered very probable that the position of the posterior zone of opacity and the posterior pole are important in this respect.

Further experiments with salt and sugar led to precisely similar conclusions. Altogether, the experiments led to the following results with regard to the conditions of nutrient supply in the case of the normal lens:

1. The nutrition processes are effected more actively and more completely in the posterior section than in the anterior section of the lens.
2. A zone lying posterior to, and parallel with, the equator appears to be that through which the most extensive supply of nutriment passes.
3. A zone anterior to, and parallel with, the equator appears also to be active in this respect, though less so than the posterior zone.
4. The posterior pole of the lens also transmits a current of nutriment, though to a less extent than either the anterior or posterior or equatorial zones.
5. No current appears to pass at the anterior pole.
6. The equator is dependent for its nutriment on the currents passing by the zones in front and behind it, but does not itself give entrance to any current.

Magnus's experiments do not give any indication as to the parts at which the nutrient fluid leaves the lens.

With reference to the very interesting question as to how far such experiments throw light on the development of idiopathic cataract, Magnus in the

first place draws attention to the fact that in the great majority of cases (in 92.77 per cent. according to a previous investigation of his) senile cataract begins exactly in the same manner as the artificial cataract. This points to senile cataract being essentially a disturbance in the nutrient current, showing itself first at the places where the current enters the lens. While, however, in experimental artificial cataract, the opacity is the result of an altered chemical constitution of the nutrient fluid, this cannot well be assumed in the case of senile cataract. It is more likely that the disturbance is more of a circulatory nature, and probably, too, this is the consequence of the senile sclerosis which takes place in the lens fibres. Further, no doubt there is a diminished power of resistance in the lens fibres of old people which favors the opacity which a stasis in the lymph-current tends to give rise to. In diabetic cataract, of course, it is natural to suppose that the opacity is more directly caused by the altered chemical constitution of the nutrient fluid.

OBSTETRICS.

UNDER THE CHARGE OF

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THE PORRO OPERATION, WITH INVAGINATION OF THE STUMP.

FRANK's method of performing the Porro operation has been adopted by BEAUCAMP, who describes five cases so treated (*Archiv für Gynäkologie*, Band xl. Heft 1). Three of the operations were done for contracted rhachitic pelves, with a history of previous confinements with death of the foetus. Mothers and children recovered.

One case ended fatally from hemorrhage between the membranes and uterine wall. The fifth case was that of a woman, brought to the hospital in a dying condition with ruptured uterus; the operation consisted of the total extirpation of the uterus after it had been inverted through the vagina. A fatal result followed, but the post-mortem showed the operation to have been successful so far as union was concerned.

Beaucamp describes his method as follows: Patients with contracted pelves are examined in the middle of pregnancy, and the chances afforded by induced labor and the Cæsarean and Porro operations are explained to them, the chances of the two latter being given as equally favorable. Labor is induced at the end of the thirty-third week. If the Porro operation is to be done, the patient enters the hospital in the thirty-ninth week, and is suitably prepared. The operation consists in opening the abdomen and the uterus, and removing the foetus. The uterus is then inverted, and its attachments to the vagina are sutured. The abdomen is then closed, and the uterus and

tubes and ovaries are removed, and the pelvic peritoneum carefully sutured. Simplicity, speed, and safety are claimed for this procedure.

If the elastic ligature is employed, and the uterus resected at the cervix, the pelvic peritoneum is stitched about the stump, which is pushed up into the pelvis and a tampon of iodoform gauze is placed against it. The after-treatment consists in antisepticizing the vagina.

FORCEPS TO THE AFTER-COMING HEAD.

A plea for the forceps to the after-coming head is made by STAEDLER (*Archiv für Gynäkologie*, Band xl. Heft 1). He adduces ten cases from Bischoff's clinic, at Basel, of which no mother died; two children died during labor, and two more after labor. Most of the children were born deeply asphyxiated, but revived. In all, Staedler tabulates fifty cases, showing 72 per cent. of living children. He would first try manual extraction, then forceps, last perforation. His cases were chiefly contracted pelves, complicated by cross position.

THE TREATMENT OF OCCIPITO-POSTERIOR ROTATIONS.

MEYER, of Dorpat, treats posterior rotation of the occiput by combined external and internal manipulation, inserting the whole or portion of the hand within the vagina, while the other hand coöperates by external pressure upon the head. He thus endeavors to rotate the occiput anteriorly, or posteriorly, and holds the head in the most favorable position obtainable until he has applied the forceps. An assistant furthers the endeavors of the operator by pressure upon the trunk through the abdominal walls. Meyer reports three illustrative cases.—*Archiv für Gynäkologie*, Band xl. Heft 1.

PUERPERAL ECLAMPSIA.

At a recent meeting of the Obstetrical Society of London, HERMAN reported five cases, and from these and others previously reported by him, summarized the following observations: (1) Four children out of ten died *in utero*. (2) The cases showed no direct effect of the fits on the temperature. (3) In all the cases observed at the beginning of the disease, except two, the quantity of urine was lessened. Of the two exceptions, one died, and in the other renal disease persisted after childbirth. (4) In all the excretion of nitrogenous matter in the urine was absolutely diminished, and in most the percentage was diminished. (5) In all the urine was at one time nearly or quite solid with albumin. In three of the cases the fits appeared to increase the amount of albumin. The two cases in which the albuminous precipitate contained the largest proportion of paraglobulin both recovered. Of three in which the amount of paraglobulin was less than in the rest, two died, and in one renal disease persisted. (6) In all that recovered there was rapid increase in the amount of urine and the quantity of nitrogenous matter contained in it, and diminution in the amount of albumin. This restoration did not, as a rule, take place till some hours after the cessation of the fits, and went on more rapidly after delivery in the cases in which the cessation of fits preceded delivery. This restoration of renal function did not take place in the cases

which died. (7) Retinitis was present in only two cases, both of which died.—*British Medical Journal*, 1891, No. 1593, p. 72.

THE HEPATIC LESIONS OF ECLAMPSIA.

An addition to our knowledge of the hepatic lesions in eclampsia, of which so much is due to the report of cases by Pilliet, is made in *Bulletins de la Société Anatomique de Paris*, 1891, vol. vi. p. 353, by PAPILLON and AUDAIN. In the case itself there was nothing of especial rarity among eclamptic cases. Labor was spontaneous; the urine contained albumin, but no bile; the patient died after labor, with icterus and high temperature.

Upon post-mortem examination, multiple ecchymoses of discolored blood were found beneath the capsule of the liver. Microscopic examination of the liver tissue revealed fatty degeneration of the liver-cells with multiple thromboses of the venous radicles, and infiltration with masses of fibrin, the thread-like reticula of which could be traced to the terminations of liver-cells. The hepatic lesions were strongly suggestive of extensive disorganization of the blood.

In discussion, Pilliet confirmed these observations, and added that he had found several sorts of microbes in the livers of eclamptic patients, but none which could be isolated as pathognomonic.

THE POISONOUS PROPERTIES OF THE URINE DURING PREGNANCY.

A curious and interesting corroboration of the belief that during pregnancy the woman excretes more toxic material than when not pregnant, is found in the result of experiments by BLANC (*Annales de Gynécologie*, 1891, Tome xxxvi. p. 15). He injected the urine of the non-pregnant and pregnant woman into rabbits, and observed the effects. Symptoms of ptomaine intoxication were more marked when the urine of pregnancy was injected, and basing a comparison upon the body weight of the various animals the ratio of toxicity was 115 to 132, the latter expressing the poisonous properties of the urine of pregnancy.

TWIN PREGNANCY IN A PRIMIPARA, FOLLOWED BY ECLAMPSIA; RECOVERY.

LOVIOT (*Bulletins et Mémoires de la Société Obstétricale de Paris*, 1891, No. 8) reports the case of a primipara having albuminuria who was found to be in labor with twins. The first child was safely delivered by the application of forceps to the breech; the second was a vertex presentation, delivered by forceps. Both children lived.

Several hours after labor the mother had eclampsia; her paroxysms gradually yielded to treatment. A portion of the vulvo-vaginal tissue became inflamed, and there was high fever. The curette was successfully used to remove the slough, and mercurial solutions were injected into the uterus. Three weeks after labor, the patient suffered from a brief attack of phlebitis. Recovery finally ensued. The most useful measure in the treatment seemed to have been the drainage of the uterus by strips of iodoform gauze.

SECONDARY PERINEORRHAPHY DURING THE PUERPERAL STATE.

VON WEISS has treated five patients who had sustained extensive laceration of the perineum in former labors by perineorrhaphy shortly after a subsequent confinement. One of the cases had prolapse and ulceration of the cervix. After antiseptic treatment had healed the eroded surfaces, the cervix was replaced and the laceration successfully repaired. The method employed was the flap-operation of Säger, and the time chosen was as soon as abraded surfaces had healed, and before the patient left her bed. The results were successful.—*Wiener klinische Wochenschrift*, 1891, No. 29.

ELEVATION OF TEMPERATURE OF OBSCURE ORIGIN IN THE PUERPERAL STATE.

COE (*American Journal of Obstetrics*, 1891, No. 6) reports, among others, the case of a patient who had high fever after confinement, without appreciable cause. A mass was finally discovered in the abdomen, and laparotomy on the twenty-fourth day after labor revealed an ovarian abscess containing a drachm of pus, situated deeply among the intestines, shut off by a thick wall from the peritoneal cavity. The appendix vermiformis could not be found, and the condition was thought to be an old appendicitis with intestinal adhesions, in which fresh inflammation followed labor. No puerperal sepsis could be discovered, and nothing abnormal in the pelvis.

TUBAL ABORTION.

In the *Transactions of the Obstetrical Society of London*, vol. xxxii. p. 342, SUTTON describes a case of tubal pregnancy in which rupture of the fetal membranes occurred after examination. On laparotomy the left tube was found to have been the seat of pregnancy, abortion in the tube having occurred from apoplexy of the ovum. This apoplexy was attended by pain and slight shock.

THE INHALATION OF OXYGEN IN TREATING NEWBORN INFANTS.

BONNAIRE (*Bulletins et Mémoires de la Société Obstétricale de Paris*, 1891, No. 6) has obtained good results, in cases of fetal asphyxia from imperfect heart and in infections destroying the red blood-corpuscle, by inhalation of oxygen.

[In severe broncho-pneumonia of infants with marked cyanosis we have had a similar experience. The dosage depends entirely upon the effect; oxygen may be inhaled until an appreciable result follows, repeated when needed.—ED.]

CÆSAREAN SECTION.

Successful operations are reported by BAR (*Revue Obstétricale et Gynécologique*, 1891, No. 4) for cystic enchondroma of the pubis; by PORAK (*Ibid.*) for cancer of the cervix, the patient and child surviving the operation, but the cancer steadily progressing to a fatal result. It is worthy of note that in this case Porak operated before labor began. CAMERON (*British Medical*

Journal, 1891, p. 511) has operated nine times successfully, checking hemorrhage by manual compression, closing the uterine wound with silk, with superficial stitches where required. Cameron had one fatal case, a patient who had fallen and had hemorrhage, who died of fatty, dilated heart. GRANGER (*Ibid.*) operated successfully upon a dwarf, using a drainage-tube through the incision and vagina.

CRIMAIL (*Annales de Gynécologie*, 1891, vol. xxxv.) operated successfully a second time upon a rhachitic woman on whom he operated in 1889. The incision was made at the edge of the first uterine wound. The silk sutures of the first operation had been absorbed, leaving only the knots partially imbedded in the uterine tissue.

GYNECOLOGY.

UNDER THE CHARGE OF
HENRY C. COE, M.D., M.R.C.S.,
OF NEW YORK.

DIVERTICULUM OF THE RECTUM SIMULATING CYST OF THE VAGINAL WALL.

HEYDRICH (*Centralblatt für Gynäkologie*, 1891, No. 21) reports a unique case of this character, in which the correct diagnosis was made before the operation. The patient developed a specific colitis soon after marriage, from which resulted a stricture of the rectum. Ulceration above the point of stricture and inflammation of the cellular tissue between the rectum and vagina followed, and a peri-rectal abscess formed, communicating with the gut; the sac gradually increased in size, causing a protrusion of the posterior vaginal wall, which at length appeared at the vulva, presenting the appearance of an ordinary cyst. The differential diagnosis was extremely difficult, the presence of the stricture being an important aid, as well as the softness and absence of tension noted in the sac. The anterior wall of the sac was incised, a quantity of turbid mucus being evacuated, and its edges were united to those of the vaginal wound. Healing by granulation promptly occurred, after which the stricture was dilated.

PAPILLOMATOUS OVARIAN CYSTOMA.

FRÄNKEL (*Deutsche med. Wochenschrift*, 1891, No. 6) confirms the general opinion that papillomatous ovarian cysts are clinically malignant, since they are prone to metastases, even though anatomically they are not atypical in structure. Their malignancy is shown by the tendency of the papillary masses to penetrate the inner wall of the cyst and spread over its serous covering and thence over the entire surface of the peritoneum. The general thickening of the latter is due to the presence of minute papillary growths, which degenerate to form a viscid fluid. Metastases have been observed in

the pleura, and in one rare instance on the aortic valves. The writer believes that, in the case of the former, papillomatous are to be sharply distinguished from simple glandular cystomata, since the prognosis is so much more grave.

ETIOLOGY OF HÆMATO-SALPINX.

WALTHER (abstract of thesis in *Centralblatt für Gynäkologie*, 1891, No. 21), after careful microscopical studies entertains no doubt of the existence of true hæmato-salpinx independent of tubal gestation. Hemorrhage into the tube may be due to primary salpingitis, to retained menstrual blood resulting from atresia and malformations, to catarrh of the tube (which may be caused by an ectopic gestation on the opposite side) or to acute congestion from suppression of the menses or infectious diseases. On comparing true hæmato-salpinx with tubal gestation it is evident that in the case of the former there is more evidence of inflammatory thickening of the serous coat of the tube; moreover, symptoms of localized peritonitis are more marked. The contents of a hæmato-salpinx may be absorbed or may remain unchanged; the blood may escape into the uterine cavity or through the distal end of the tube, gradually forming an hæmatocele; or the sac may rupture, with symptoms of internal bleeding and the rapid development of a hæmatocele. Abdominal section is indicated under all circumstances.

VEIT (*Centralblatt für Gynäkologie*, 1891, No. 22) would limit the term hæmato-salpinx to cases in which either the tube is gradually distended by the escape of blood into it, or in which hemorrhage takes place into a previously dilated tube. The latter may be due to torsion of a hydro-salpinx (as in a case reported by Sutton), or more rarely to trauma or neoplasms. An important point in the macroscopical diagnosis of true hæmato-salpinx is the fact that *the distal opening of the tube is closed*, which is not the case in tubal gestation.

[We have called attention to the fact that in true hæmato-salpinx the *entire* tube is apt to be dilated on account of the closure of the distal end, whereas, in tubal gestation the dilatation is confined to a portion of the tube.—H. C. C.]

ANATOMY OF THE TUBES.

COHN (*Med. Monatsschrift*, 1890, Heft ix.), from independent microscopical studies of sections of normal tubes, has arrived at the following conclusions: 1. The folds in the mucous lining of the tube are more numerous at the uterine than at the abdominal end. 2. These folds increase in number with advancing age. 3. In old subjects the ciliated epithelium disappears, being replaced by non-ciliated columnar or squamous epithelia. 4. The columnar epithelium is often replaced by goblet-cells and by cells with branching processes, which seem to possess a sort of contractile power. 5. There is an entire absence of glands.

DIAGNOSIS OF CARCINOMA CORPORIS UTERI.

HOFMEIER introduced a discussion of this subject at the recent meeting of the German Gynecological Society. He called attention to the fact that cancer frequently develops from the superficial epithelium, and that under

deformity was reduced, and who have been allowed to walk without a high shoe and crutches, present a moderate degree of adduction, absence of motion, and in a few cases slight flexion. On the other hand, patients who have worn the long splint until cured, who have remained in the horizontal position until all pain and muscular spasm subsided, who have then used the high shoe and crutches, and who have been carefully watched and nursed, have been cured without flexion and without deformity other than that due to bone erosion and arrested growth. Moreover, in these cases motion has been free, and, in some instances, even normal. Finally, those patients who have had no traction are found to be singularly free from the conditions which it is commonly believed are to be relieved only by long-continued traction.

LATERAL DEVIATION OF THE SPINE AS DIAGNOSTIC OF POTT'S DISEASE.

On the basis of Bartow's observation as to the frequency with which lateral deviation of the spine is found in cases of dorsal and lumbar Pott's disease, LOVETT (*The Boston Medical and Surgical Journal*, vol. cxxiii., No. 15) made careful observations upon some thirty cases of spinal caries. He finds that in untreated cases the presence of lateral deviation is universal. This deformity is least characteristic when the disease involves the cervical vertebræ; but in all other cases, if the patient be stripped and inspected from in front when standing as squarely as he can hold himself, it will be found that a perceptible degree of deviation of the spinal column is present. This is much more readily perceived in this way than when the back alone is inspected. The picture presented is not like that of rotary lateral curvature. There is a distinct leaning of the body toward one side or the other, rather than a sinuous distortion. This leaning is most frequently toward the right, and is of diagnostic value because it is one of the earliest symptoms of Pott's disease. In several cases it could be distinctly perceived when other symptoms were slight and ill-marked. Rotation was never very marked, being in no way comparable to that found in true scoliosis. When observed, it was often found not to follow the same rule as in scoliosis—that is, rotating backward on the side of the convexity of the curve. In a third of the cases the rotation was in the opposite direction. The lateral deviation was much more noticeable in the standing than in the lying position, and is probably due to reflex muscular spasm.

MUSCLE-TRANSPLANTATION.

The experimental research of GLUCK (*Deutsch med. Woch.*, No. 17, 1890), which seems to show that comparatively large pieces of muscle could be transplanted and maintain their vitality and physiological functions, leads him to conclusions so entirely opposite to generally accepted histological and pathological teachings that MAGNUS (*Münch. med. Woch.*, No. 30, xxxvii. Jahrg.) conducted a series of test-experiments. As a result he finds that, after excision of a portion of muscle and repairing the defect by muscle taken from an animal of the same species, if the seat of operation remains sterile the transplanted fragment apparently retains its vitality and becomes physiologically active, since examination two months after operation shows no difference

[In this connection *vide* paper on "Adenoma Uteri" in the August number of the JOURNAL.—H. C. C.]

GONORRHOEA IN THE FEMALE.

BUMM (*Centralblatt für Gynäkologic*, 1891, No. 22) thus summarizes the results of his studies of this subject, which extend over a period of ten years:

1. Gonorrhœa in women is a process limited to the superficial layer of the mucosa; the cocci invade the epithelial layer, but are always arrested when they reach the submucosa. The epithelium is originally cast off by reason of the active suppuration, but is quickly renewed, assuming the pavement form; after this change has occurred the active invasion of gonococci is usually arrested, but they continue to grow in the secretion, in which they may persist for months and years.

2. The gonococci have no connection with septic processes; they do indeed cause suppuration of the mucosa, but are destroyed when they reach the subjacent connective tissue. If sepsis develops it must be in consequence of mixed infection; septic germs are frequently present in gonorrhœal pus, and a favorable nidus for the reception of external germs is offered by the purulent genital secretion.

3. The urethra and cervical canal are the favorite seats of gonorrhœal infection; acute gonorrhœa of the cervix gives rise to symptoms only at the outset, but after it has become chronic it may exist for years without causing disturbances, unless it extends to the corpus uteri and thence to the tubes.

The cocci possess no power of spontaneous movement and extend only short distances by proliferation. Extension over larger surfaces must be through the agency of the secretion. Normally the cervical secretion cannot pass the os internum, which also serves as a barrier to the entrance of the specific infection. Menstruation favors the admission of cocci into the uterine cavity, also certain mechanical causes, such as coitus, the introduction of sounds and intra-uterine medication; lastly, this is liable to occur during the puerperium. After they have reached the cavity they again remain stationary, and probably are only carried into the tubes from the causes already mentioned, the puerperium being the most favorable time, as the proximal openings of the tubes are then more patent. In fifty-three patients with gonorrhœa, who were kept under observation for at least five months after the initial symptoms developed, the cervix was infected in 75 per cent., the corpus uteri in 15 per cent., and the tubes in only 3.5 per cent.

WERTHEIM (*Centralblatt für Gynäkologic*, 1891, No. 24) reviews the subject of so called gonococci-peritonitis, the existence of which is denied by Bumm, who affirms that when the cocci come in contact with the peritoneum they are simply encapsulated like any other foreign bodies, the development of peritonitis secondary to gonorrhœa of the tubes being due to mixed infection. Subsequent microscopical studies have shown that the cocci may penetrate the squamous epithelium which covers serous surfaces. Their absence in the exudates of peritonitis is no proof that they may not have originated the inflammatory process prior to their disappearance. After a thorough investigation of the subject, he finds as the result of numerous experiments upon animals that the coccus may, under the same conditions, produce peritonitis

these circumstances it assumes the alveolar form. The glandular form presents an incipient or adenomatous stage, which persists for some time; later epithelial outgrowths invade and destroy the muscular tissue. The diagnosis of carcinoma can be made microscopically only when the fact of this infiltration of the deeper tissues is established. Hemorrhage (especially after the climacteric) is the initial symptom, sometimes a foul discharge, less frequently colicky pains. The evidence afforded by the bimanual is not positive; the examination of fragments removed by the curette furnishes positive proof of the presence of cancer, and enables the surgeon to decide whether he has to do with the alveolar or glandular variety. It is not sufficient to remove superficial portions of the growth and merely to demonstrate the presence of epithelial clusters in addition to the glandular processes; the invasion of the muscular layers must be noted. The differential diagnosis between carcinoma and malignant adenoma is practically unnecessary. In endometritis there is general and regular hypertrophy of the glands, their columnar epithelium remaining unchanged, while the reverse is the case in carcinoma.

LEOPOLD, continuing the discussion, said that he had examined microscopically seventy-eight cancerous uteri, which had been extirpated *per vaginam*, in twenty-seven the disease being confined to the body. As a result of his studies he had arrived at the following conclusions: 1. Carcinoma uteri, wherever situated, has always an epithelial origin. 2. It is to be described as an atypical epithelial neoplasm. 3. Its most frequent seat is below the level of the os internum, and it originates in the epithelium of the portio, seldom in that lining the cervical canal. 4. Commencing epithelioma of the portio vaginalis is encountered more frequently than has been supposed, and even when apparently springing from the cervical canal its connection with the squamous epithelium of the portio can be demonstrated. 5. In 25 per cent. of the cases of carcinoma of the infra-vaginal cervix the disease extends to the os internum. 6. In cases of carcinoma of the portio the corporeal endometrium is usually hypertrophied. The writer has never observed accompanying sarcomatous degeneration of the endometrium, and rarely adenoma. 7. Isolated cancerous nodules may exist in the corpus uteri in connection with cancer of the cervix. 8. Primary carcinoma of the body of the uterus nearly always assumes the diffuse superficial, seldom the isolated nodular form. The first stage is thickening of the mucosa, followed by glandular proliferation, atypical epithelial outgrowths in the form of tufts and alveoli, and finally invasion and destruction of the muscular layers. 9. The epithelial growth is composed of papillary projections richly supplied with bloodvessels, so that it may be properly described as *carcinoma papillare*. 10. The term "malignant adenoma" is entirely superfluous and misleading, since an adenoma is a benignant neoplasm, and as soon as it becomes atypical—that is, invades the surrounding tissue—it is no longer adenoma, but papillary carcinoma. 11. In the initial stage of the disease the diagnosis may be positively established by the removal of fragments with the curette, in which will be found under the microscope the characteristic glandular proliferation, new formation of vessels, and invasion of the subjacent muscular tissue. When extensive ulceration has occurred, however, the microscopical diagnosis is uncertain, since only necrosed tissue is removed by the curette.

douche. Usually, after a week of such treatment the hypertrophied endometrium is shrunken, and after the astringent injections have been continued for a short time the affection is entirely cured. In three cases of obstinate recurring corporeal endometritis, in which no result was obtained by eutretting, a rapid cure followed the use of intra-uterine applications of pure ichthyol-ammonium.

Fissure of the nipple in nursing women is successfully treated by pencilling the crack with pure ichthyol-zinc after the child has nursed. The pain is quickly relieved, and a cure may be expected in from two to five days.

THE SURGICAL TREATMENT OF TUBERCULOUS PERITONITIS.

KOCKS (*Centralblatt für Gynäkologie*, 1891, No. 24) operated upon a patient with supposed tuberculous ascites, but found no tubercles on the peritoneum. He raises the question whether ascites may not develop in connection with extra-peritoneal tuberculosis, the effusion being due either to collateral hyperæmia or to the direct irritation of the secreting surface by atoxine. In like manner Löffler's diphtheria bacillus has been shown to be the direct cause of pleural effusions without entering the pleural cavity; also, tuberculous osteitis may cause synovitis, though the fluid from the joint is free from bacilli.

It is inadvisable to completely close the abdomen after performing laparotomy, as it may be necessary to operate again on account of recurrence; in one case the writer performed laparotomy three times. He now invariably leaves the lower angle of the wound open, inserting a drain of iodoform gauze.

DECIDUOMA.

Under this term, originally suggested by Maier, SÄNGER (*Centralblatt für Gynäkologie*, 1891, No. 24) includes true decidual sarcoma and not the ordinary neoplasms which have been loosely described under this head. Several cases of so called deciduoma have been reported by Maier, Klotz and Küstner, but a careful study of their descriptions shows that only one of these was a true neoplasm (fibro-adenoma), the other tumors being either mucous polypi or placental moles; one case turned out to be carcinoma. The writer first described true "malignant metastatic deciduoma, or decidual sarcoma" two years ago, since which time Pfeiffer has described one case and referred to three others reported in 1877 by Chiari, who then regarded the condition as carcinoma corporis uteri developing immediately after birth. All five cases presented the same clinical history and terminated fatally within six or seven months after delivery. Anatomically the writer's case differed from the others in the following respects: The growth assumed the form of nodules which originated within the deep muscular tissue and grew inward, forming fungoid excreescences within the uterine cavity, the mucous lining of which was entirely wanting, being replaced by a sort of cicatricial tissue containing small sarcomatous round- and spindle-cells. It thus appeared that while the decidual remains formed the nidus of the neoplasm, they did not possess the power of regenerating the endometrium. Sections of the nodules showed that they were composed of changed decidual cells of a polymorphous char-

the same as the other pyogenic microorganisms. Now, it may be urged that experiments on animals do not form a reliable basis on which to found a theory as to the development of this form of peritonitis in the human subject; but, as an actual fact, mucous surfaces in the former are less sensitive to the action of the cocci than are those of man, hence in the latter peritonitis would be more likely to occur from contact with them. Not only may the gonococci penetrate squamous epithelium, but they may make their way into the subjacent connective tissue and there enter the lymph-spaces, extending in the same manner as other pyogenic organisms. This is an important fact, since heretofore all inflammations of the deeper tissues accompanying gonorrhœa have been referred to mixed infection; now, peri-urethral abscesses, suppuration of the glands, parametritis, and even oöphoritis, may be regarded as due directly to the influence of the gonococcus. It is a striking fact that no one has ever found any other pyogenic bacterium except the gonococcus in the contents of a pyosalpinx, even though the condition was complicated with extensive inflammatory changes in the tubes, ovaries and peritoneum.

The writer has found the coccus in the pus from sixteen cases of pyosalpinx, but never succeeded in discovering any other form of microorganism, even after the most careful search; there is no reason to infer from this that other bacteria are supplanted by the cocci, since Menge has shown that the former possess a much greater power of resistance than the latter. The writer has also disproved, by numerous culture experiments, Zweifel's assertion that old gonorrhœal pus forms a particularly favorable nidus for pyogenic and septic organisms; the reverse seems to be the case. It seems only fair to limit the term "mixed infection" to those cases in which, after a distinct preceding gonorrhœal infection, the presence of organisms other than gonococci can be demonstrated; of these the writer has seen but two undoubted examples. Abscesses of the ovary may be divided into two classes, according to their etiology—puerperal and gonorrhœal. The former are not uncommon; the *streptococcus pyogenes* is usually found in the pus. That ovarian abscess may be of gonorrhœal origin is proved by a case cited by the writer in which a girl of sixteen had a double pyosalpinx and abscess of both ovaries; in the contents of the right abscess-sac numerous gonococci were found, while the pus from the left one contained no bacteria whatever.

[We recently operated in private upon a child, aged fifteen years, of good family, who had a condition similar to that in the case cited, for which no cause could be found except exposure to cold at a menstrual period. In this case specific infection and puerperal, or traumatic, influences could be absolutely excluded. The pus was extremely acid, but, unfortunately, was not examined for microorganisms.—H. C. C.]

ICHTHYOL IN THE TREATMENT OF DISEASES OF WOMEN.

FREUND (*Berliner klin. Wochenschrift*, 1890, No. 45) speaks highly of this drug in the treatment of endometritis. He first tampons the vaginal fornix with pledgets of cotton saturated with ichthyol in glycerin until the cervix is reduced in size, then applies pure ichthyol-ammonium or -sodium to the inflamed mucosa, the patient being directed to use daily a hot astringent

writer is inclined to explain his cases according to the latter theory, believing that the cells of adenoma bear a close resemblance to those of carcinoma, and may be inoculated upon the healthy peritoneum in the same way. The occurrence of this complication emphasizes the necessity of preventing the entrance of cyst-contents into the peritoneal cavity during operation, since it may lead to serious results.

[We agree with the writer that these cases are probably not so rare as might be inferred from the small number that have been reported. We recall a typical one at the Woman's Hospital.—H. C. C.]

TORSION OF A FIBROID UTERUS.

RICK (*Prager med. Wochenschrift*, 1891, No. 19) reports the following interesting case: The patient, aged fifty-six years, had complained for a month of severe pain in the abdomen and obstinate constipation, with moderate elevation of temperature. Two weeks before entering the hospital her bowels had not moved for eight days; four days before entrance she had a small movement, and when admitted her abdomen was greatly distended, so that it was impossible to make out anything definitely. She died suddenly the same night while using the bed-pan.

At the autopsy a subperitoneal fibroid larger than a man's head was found, which had a pedicle that had been twisted about its axis from left to right. Closer investigation showed that this pedicle was composed of the elongated uterus, which had made two entire revolutions on itself, the ovaries and tubes being wound around it. On section the tumor was congested, but nowhere necrotic. Several coils of intestine were adherent to the mass, causing obstruction of the gut. Few similar cases have been recorded and the etiology is obscure. The peristaltic movements of the adherent intestines probably had something to do with the torsion. As is known, torsion of the pregnant uterus is a well-recognized complication in veterinary obstetrics.

PRIMARY SARCOMA OF THE CERVIX UTERI.

KLEINSCHMIDT (*Archiv für Gynäkologie*, Band xxxix., Heft 1) in reporting a case of this affection, refers to Winckel's collection of nine cases published in 1883, some of which were of doubtful character. Winckel reported one case of adeno-myxo-sarcoma and one of round-celled sarcoma of the cervix uteri. The author's patient was thirty-six years of age, and applied at the Munich clinic, in 1888, on account of a sanguineous discharge (with some odor) of two weeks' duration, accompanied with sacral pains. A supposed malignant growth was removed from the cervix with the sharp spoon, and its base was cauterized. She had a recurrence, but became pregnant and had a normal labor; ten weeks after a second operation was performed, a soft tumor about the size of an orange being excised from the posterior lip. Five months later it was necessary to curette and cauterize again. On microscopical examination the neoplasm was found to be a spindle-celled sarcoma, which in spots seemed to be carcinomatous.

Of the fourteen cases on record six patients had borne children. The ages of all varied from ten to sixty years. The symptoms were hemorrhage and

acter, imbedded in a well-marked reticulum in which were numerous multinucleated giant-cells. The epithelial cells were arranged in pseudo-alveoli, and there were many dilated veins and localized hemorrhages. Metastatic nodules were found in the lungs, which presented an identical structure, undoubted decidual cells being found.

The term "deciduoma" applied to this neoplasm is incorrect, since it is really a sarcoma, the cells of which assume, by reason of the tissue in which it originates, the decidual type. Gusserow has stated that eleven per cent. of the cases of carcinoma corporis uteri are directly traceable to the influence of the puerperal state, so that it is important to distinguish this condition from "sarcoma deciduo cellulare." Probably the majority of the cases of carcinosarcoma described by Klebs are clinically and anatomically identical with the neoplasms described by the writer.

As regards the etiology of the growth two facts point to its probable infectious origin—its close resemblance to the *mycosis fungoides* of the skin (described by Rindfleisch), and the presence of a preceding septic endometritis in every reported case of decidual sarcoma. It is highly desirable that the condition should be promptly recognized before metastasis has occurred, as early extirpation of the uterus might result in a radical cure.

THE INFLUENCE OF CASTRATION UPON THE CILIATED EPITHELIUM OF THE UTERUS.

KRUKENBERG (*Centralblatt für Gynäkologie*, 1891, No. 22) has made some interesting observations in this direction. While in childhood ciliated epithelium is found only in the tubes and later develops in the uterus, after the climacteric all the ciliated epithelium lining the genital tract is destroyed. As observations upon the living subject are not likely to be conclusive, since the almost constant presence of endometritis before castration would in itself lead to destruction of the cilia, the writer conducted a series of experiments upon rabbits and guinea-pigs, with the following results: Seven months after removal of the ovaries the size of the uterus was not altered and the ciliated epithelium was unchanged; ten months after operation the organ was considerably smaller and the cilia disappeared from the mucous lining of both the uterus and the tubes, showing that there was a direct relation between the uterine atrophy and the disappearance of the cilia. The inference may thus be drawn that castration has precisely the same effect upon the uterus as the climacteric. If the ovaries are removed from a young immature animal the usual development of ciliated epithelium does not occur at all.

DEVELOPMENT OF CARCINOMA IN THE CICATRIX AFTER OVARIOTOMY.

FRANK (*Prager med. Wochenschrift*, 1891, Nos. 21 and 23) reports two cases of this character observed by himself, and has been able to find but three more in the literature, in which, after removal of a simple myxoid cystoma, the cicatrix became cancerous. Olshausen suggests that in these cases either the cyst was of the mixed form, containing malignant portions, or else that fragments of benignant adenoma were left behind or escaped into the peritoneal cavity, sprouted and underwent cancerous degeneration. The

there were also other significant symptoms connected with the organs of special sense. Professor Jacobi agreed with Dr. Northrup in the importance of the persistent vomiting as a diagnostic sign; the vomiting is apt to be marked when the meninges of the base of the brain are the seat of the tubercular deposit; if the tubercular deposit is not marked in this region the vomiting is apt to be less pronounced or absent. Distinction must be made between the cerebral type of vomiting, which is projectile and not accompanied by nausea, and that which is merely reflex or of gastric origin. Dr. Northrup traced the infection in one of his reported cases to the use of tuberculous milk.

— — —

PATHOGENESIS AND TREATMENT OF INTESTINAL CATARRH IN CHILDREN.

ANTIQUEDAD (*Annales de Obstét., Gyn., et Péd.*, 1890) states that the treatment of intestinal catarrh in children is one of the most difficult matters in therapeutics. This is shown by the diversity of methods of treatment, some of which are merely empirical while others are rational. This shows that we must adopt a fixed criterion if we would desire to cure our patients. Treatment has consisted mainly in combating the causes which produce intestinal catarrh and the symptoms which threaten life, without particular reference to the alimentary regimen, which should be adapted to the age and the progressive growth of the child. It should never be forgotten that mothers should be taught that there is no better food for children during the first few months of life than milk, which combines all the elements necessary for growth. The milk must also be of good quality, and if the mother cannot supply it from her own breast it should be supplied by a wet-nurse whose child is of about the same age as the one she is to nurse.

For the fever and the diarrhœa, which constitute the prominent symptoms in intestinal catarrh, the author has found best success in the use of hydrotherapy and sulphate of quinine. For the former he advises general baths once a day, and not more than thirty minutes in duration, of a temperature which shall not be higher than 28° C. nor less than 24° C. The sulphate of quinine is used in solution, one gramme being dissolved in three hundred grammes of alcohol. It is used in the form of fomentations along the vertebral column. The author also found that the diarrhœa could be satisfactorily treated with chlorate of potash, which is eliminated by the mucous membranes. One part of the potash should be dissolved in one hundred of water and combined with ipecac. Small doses of the mixture should be given every quarter of an hour. If this treatment is not efficient, revulsives in the form of thapsia plasters should be used, the plasters being applied upon the abdomen. The conclusions of the author are embodied in the following propositions:

1. A pathogenesis of intestinal catarrh in children has reference mainly to the use of indigestible food.
2. This catarrh is produced when the milk of the child is of improper quality.
3. Cold is frequently the cause of intestinal catarrh in children by suspending perspiration and producing a fluxion in the place of it.

foul discharge. Pain was not constant. The symptoms were usually of short duration, seldom over eighteen months. Primary sarcoma is prone to rapid degenerative changes and metastases, especially in the parametric tissues.

The diagnosis is based upon the peculiar whitish, sago-like appearance of the growth and its tendency to break down. It does not tend to extend up into the uterine cavity or to involve the vagina so rapidly as carcinoma of the cervix. The prognosis is bad. As regards treatment, total extirpation of the uterus should be performed if the growth is limited to the cervix, but a recurrence is more apt to occur than with cancer. Temporary relief is afforded by curetting and thorough cauterization.

PÆDIATRICS.

UNDER THE CHARGE OF

JOHN M. KEATING, M.D.,

OF PHILADELPHIA ;

A. F. CURRIER, M.D.,

OF NEW YORK,

AND

W. A. EDWARDS, M.D.,

OF SAN DIEGO, CAL.

THE IODIDES IN SCROFULOUS CHILDREN.

Iodine and iodoform give better results than the alkaline iodides. To young children tincture of iodine may be given, one drop daily in a little thin porridge made of farina and milk. BESNIER (*Le Bulletin Médical*, 1890, p. 595) prefers the use of iodoform, which may be given continuously for a long time. He prescribes it after the following formula :

R.—Iodoform	.	.	.	.	.	.	.	gr. jss.
Mellis	.	.	.	.	.	.	.	3iv.—M.

ACUTE PEMPHIGUS IN AN INFANT INFECTING THE MOTHER.

An infant three days old had an attack of acute pemphigus, the palms and soles of the feet being the only parts free. Four days before the bullæ ceased to appear several formed on the breast and forearms of the mother, who always wore short sleeves. These bullæ exactly corresponded in form to those on the child, and they ceased to appear after the infant was cured. There was no suspicion of syphilis.—*Lancet*, 1890, p. 850.

DIAGNOSIS OF TUBERCULAR MENINGITIS IN CHILDREN.

At a recent meeting of the American Pædiatric Association, DR. W. P. NORTHRUP read an interesting paper on this subject. He gave four symptoms which, when they existed together, were to him convincing evidence of the disease—persistent vomiting, irregular pulse, irregular breathing, apathy ;

pool which formed in the wound. The pulsating tumor previously described decreased in an hour to one-half its former size and in thirty-six hours was the size of an almond.

Before daylight the child took freely of hot milk and stimulants, and at 8 A. M. the temperature was 99°, pulse 96, respiration normal. No difficulty or pain in turning the head. Recovery was rapid and uninterrupted. The wound united without suppuration, and on the eighth day the stitches were removed.

TETANOID CONVULSIONS IN AN INFANT; OPERATION; RECOVERY.

RONALDSON (*Canadian Practitioner*, 1891) recently reported a case that arose when the child was nine days old. It was considered to be one of tetanus, whose starting-point seemed to be the neglected or badly-taken-care-of umbilicus. At first the convulsions were confined to the left side of the body; restlessness led on to tonic muscular contraction, and that was succeeded by well-marked clonic convulsions. Between the attacks the child was apparently well. The convulsions increased to the number of 204 in the twenty-four hours, while during their occurrence the tongue became blue-black, and at times well-marked opisthotonos supervened. On one occasion they were never absent for one whole hour, and for a period of nine hours the child was unable to suck, in consequence of the frequency of the fits. When they did not come too rapidly, it took its nourishment greedily. They varied in frequency from about 100 to 204 in the twenty-four hours, but not in such a way as to warrant us in believing that treatment, local or general, had any beneficial effect.

Dr. Brakenridge, who saw the child, and subsequently confirmed the diagnosis, gave it as his opinion that the convulsions were not due to any disease originating in the brain, but that they were peripheral in their origin, and probably had the umbilicus as their starting-point.

Excision of the umbilicus was performed, and at once there was improvement, and the fits gradually decreased.

They returned later in a lesser degree, but were controlled by sulpho-carbolate of soda, and the child perfectly recovered. Microscopic examination of the excised umbilicus did not detect any special organism in it.

Note to Contributors.—All contributions intended for insertion in the Original Department of this Journal are only received *with the distinct understanding that they are contributed exclusively to this Journal.*

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All communications should be addressed to

DR. EDWARD P. DAVIS,
250 South 21st Street, Philadelphia.

4. Hydro-therapy, sulphate of quinine, chlorate of potash, and revulsion are the means which will be found most efficient in the treatment of intestinal catarrh in children.

LIGATION OF THE COMMON CAROTID ARTERY, IN A CHILD OF THREE AND A HALF YEARS, FOR HEMORRHAGE FOLLOWING PERITONSILLAR ABSCESS; RECOVERY.

Parenchymatous inflammation of the tonsil is rare in children. In one thousand cases treated by Sir Morell Mackenzie at the Hospital for Diseases of the Throat (*Pharynx, Larynx, and Trachea*, p. 37), there were only thirty-five cases under ten years of age. Dr. Beverley Robinson (Keating's *Cyclopædia of Diseases of Children*, vol. ii. p. 441), in speaking of the age at which deep-seated inflammation of the tonsil occurs in children, says: "I cannot recall a single instance in which I have seen suppurative tonsillitis in a small child." Dr. Goodhart (*Diseases of Children*, p. 105, quoted by Robinson) reports the case of a girl, six years of age, who, when she came under his care, showed a large, deep ulcer, "which could," he thinks, "only have originated in acute suppuration of the tonsil." A case is reported by Norton (*The Throat and Larynx*, 1875) in which the disease in a little girl, four years of age, terminated fatally from hemorrhage, the abscess having ulcerated into the carotid artery.

DUNN'S patient (*University Med. Magazine*, 1891) was the offspring of healthy parents, though there was a decided disposition to tuberculosis in the mother's family. No especial tendency to quinsy, rheumatism, or scrofula and no hæmophilia in the family. The child presented an intense right-sided tonsillitis, the inflammation having extended to the adjacent parts of the pharynx and palate.

On the fourth day the tonsillar abscess ruptured, and for the next seven days the child had six severe and prostrating hemorrhages. The blood was seen to flow between the tonsil and upper part of the posterior palatine fold; a lump now appeared in the submaxillary region which rapidly increased and became a pulsating tumor, two and a half inches in length by one and a half in breadth, extending from the mastoid process beyond the angle of the jaw, and with each pulsation the jaw and head were elevated. The temperature at the time was 101° F., pulse 108, feeble and small. The child was in a drowsy condition, and for several hours had refused nourishment. The nature of the tumefaction appeared to be that of false aneurism, and the necessity for the immediate ligation of the artery was impressed upon the parents.

From the uncertainty of the situation of the bleeding-point and the danger of further loss of blood from opening the tumor, ligation of the common carotid above the omo-hyoid was elected. Careful dissection was made, and in a short time the artery was exposed without injury to any important structure. A catgut ligature was used and the ends cut close to the knot. After introducing catgut drainage, the wound was closed with silk sutures and dressed with iodoform and bichloride gauze. The operation was borne well and with but little loss of blood. What did ooze was of a pale wine-color; in fact, it was so watery that the structures could be seen through the little

microscopically or functionally between the transplanted tissue and its normal environment. If, however, the seat of operation is examined earlier, he finds that the transplanted muscle undergoes complete degeneration and absorption, the resultant defect being finally filled in by organization of muscular tissue originating and extending from the living surrounding muscle. When a great part of a muscle was removed and its place supplied by transplanted tissue, there resulted simply a fibrous cord, thus showing that though each muscle has undoubted regenerative power, such power is limited. It must follow, from this, that the wisdom of muscle-implantation with the idea of thus piecing-out defects caused by wounds or operations can be seriously questioned; though experiments would seem to show that such grafts may be useful when employed for the purpose of bridging defects in the continuity of muscles or tendons.

OTOLOGY.

UNDER THE CHARGE OF

CHARLES H. BURNETT, M.D.,

AURAL SURGEON, PRESBYTERIAN HOSPITAL, ETC., PHILADELPHIA.

BEZOLD'S FORM OF MASTOID DISEASE AND THROMBOSIS OF THE LATERAL SINUS.

PROF. S. MOOS, of Heidelberg, reports four cases of this interesting and important disease (*Archives of Otolology*, vol. xix. p. 161, April-July, 1890).

Bezold's form of mastoid disease is that in which the abscess opens in the digital fossa or *inner* surface of the mastoid process. The pus then accumulates beneath the cervical fasciæ, and large, painful, burrowing abscesses occur in the side of the neck (gravitative abscess). The diagnosis may be difficult in the early stages of the disease. "A hard, painful swelling in the retro-maxillary fossa, often devoid of redness, may be the only symptom at the commencement, the mastoid process being apparently unchanged, without any infiltration of the overlying integument, and even showing scarcely any sensitiveness to pressure, though usually this is elicited upon percussion. Elevation of temperature may be absent in the early stages or may be transient and insignificant." This form of mastoid disease occurs usually with acute or subacute inflammations in the middle ear, and Moos regards it as the most serious form.

In Moos's first two cases the sclerosed mastoid was chiselled away to the extent of one centimetre in diameter, and pus was found beneath the skin and fasciæ. The first case recovered from the aural malady, but died of pulmonary tuberculosis four months later, and the second case died some weeks after the operation of cerebellar abscess. There was severe vertigo, even when in the recumbent position, vomiting, and obstinate constipation.

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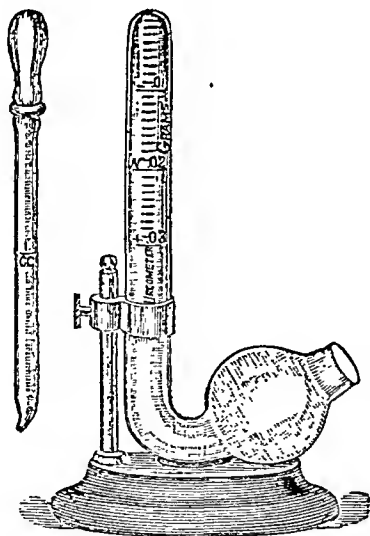
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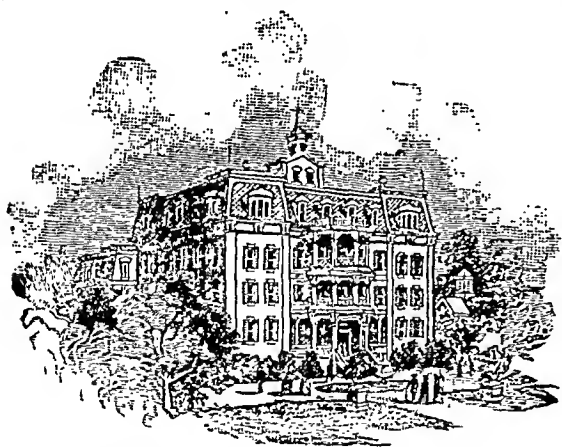
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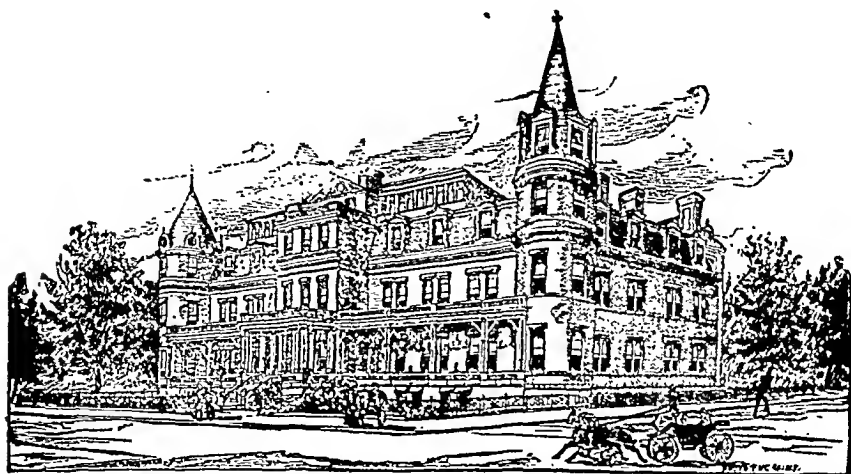
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Have been treated within its walls. In consequence of the acquired experience, showing the advisability of such a course, arrangements have been made to enlarge the scope of the Sanitarium by establishing two additional departments—one for the Diseases peculiar to Women, and one for the Diseases of the Throat and Nose. The department of

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No autopsy. The third case died from septicæmia. On account of the great difficulty in chiselling away the mastoid process, Moos then determined, in subsequent cases of Bezold's mastoid disease, simply to open the antrum, "hoping to meet the indications by the easier method."

Therefore, in a case of otitis media purulenta of the left side (probably recent), with swelling in the retro-maxillary fossa, and longitudinal narrowing of the external auditory canal as the only symptoms of mastoiditis, and in which pyæmia occurred before and after the operation, with symptoms of *thrombosis of the lateral sinus*, the operation with the chisel and mallet was performed on the mastoid in the usual way and the antrum laid open, by applying the chisel at the level of the *spina supra meatum*, and advancing downward and forward from above and behind to a depth of two centimetres, when pus was reached in the antrum. Irrigation with a sublimate solution was then kept up for a month, when the pyæmic symptoms disappeared. There were at one time symptoms of embolic pneumonia.

Moos maintains that, when thrombosis of the lateral sinus exists or is suspected, the mastoid process should be trephined, because, as thrombosis of the lateral sinus may be recovered from if the patient overcomes the consequences of the breaking-down of the thrombus, and as these consequences can be escaped the more readily if the cause is removed, therefore, operative interference in thrombosis of the lateral sinus would be likely to yield more favorable results than the treatment by cinchona and wine hitherto relied on. By such an operation on the mastoid the pyæmic focus is attacked and the number of cocci in the blood diminished to a quantity compatible with life, until they are all overcome by antiseptics.

RUPTURES OF THE MEMBRANA TYMPANI, WITH ESPECIAL REFERENCE TO THEIR FORENSIC IMPORTANCE.

DR. LEOPOLD TREITEL, of Breslau, Germany, has contributed an article on this important topic in the *Archives of Otolology*, April-July, 1890. He reports observations of eighteen cases, occurring between March, 1887, and April, 1888.

Among these eighteen cases there were but two of perforation of the membrana by direct injury. These two accidents happened from the insertion of hairpins in the ear. The other perforations were of the class known as indirect, as by blows on the ear, and various forms of concussion. The percentage of occurrence of traumatic perforations of the membranae is from one to two per cent. of all ear cases. In some instances a fracture of the skull, chiefly from above downward, is directly continued upon the membrana. In one case the perforation was caused by diving. "Boxing the ear" was the cause of the vast majority. In the legal consideration of these latter cases there are two points to be borne in mind: first, "whether in the absence of simulation the hearing has been injured permanently—for life or for a long period of time; and secondly, whether an ear so injured by a blow had been previously healthy."

The author doubts whether it is the diseased membrana tympani only which is ruptured by a box on the ear. It is not easy to judge of the state

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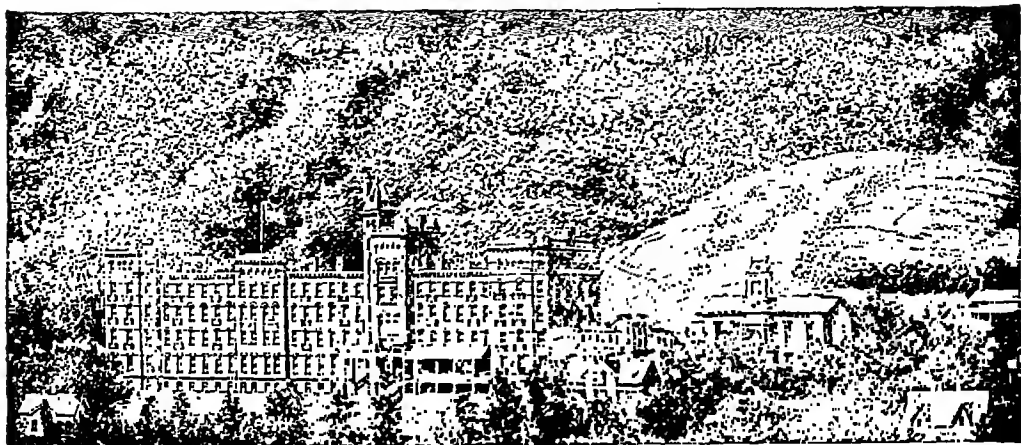
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" Phosphorus, C. P.	- - - - -	1-300 gr.
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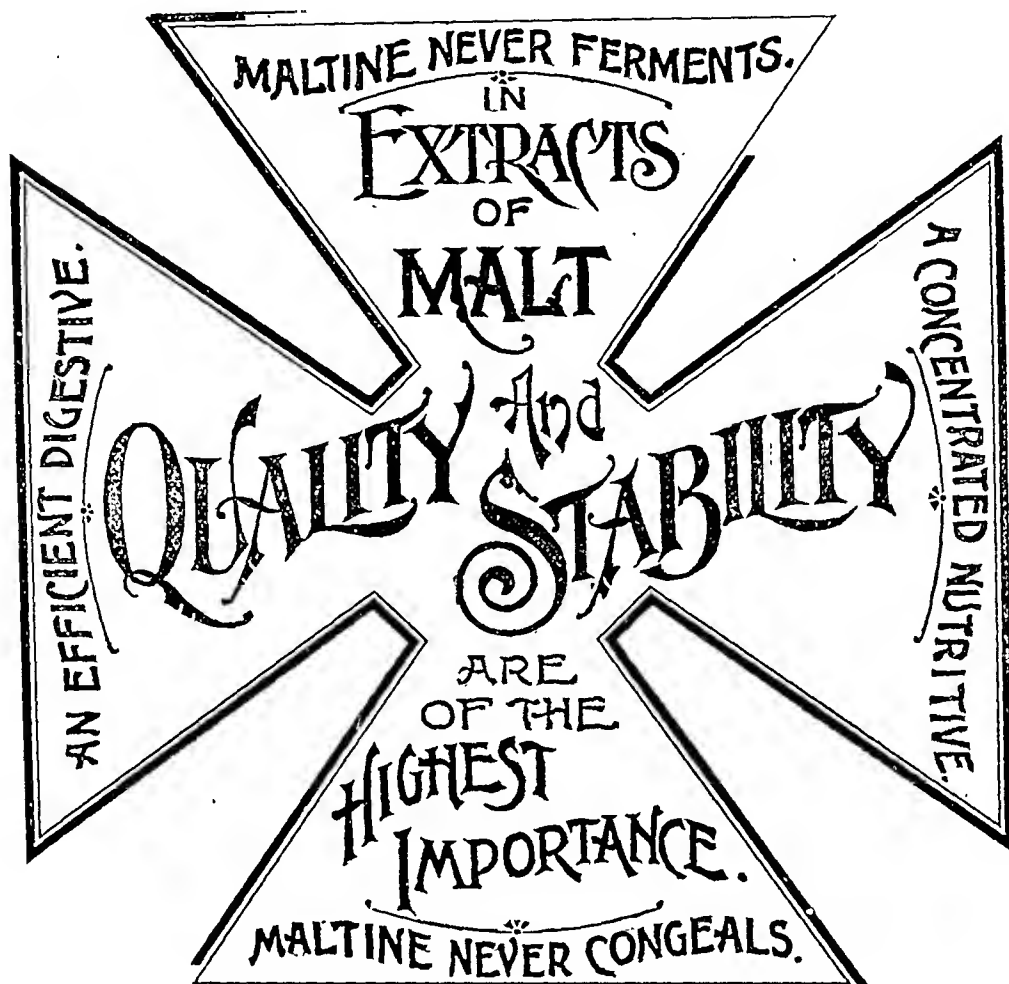
also true, and has been proven time and again at post-mortems and in the dissecting room, by the cicatrices of former pulmonary lesions in those who have died from other causes, that if the normal vitality be restored before the destructive process has gone too far, the disease may be entirely overcome.

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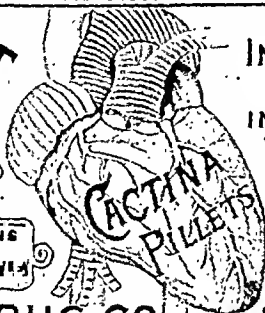
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CONTENTS.

ORIGINAL COMMUNICATIONS.

	PAGE
On the Diseases of the Kidneys Popularly Called "Bright's Disease." By FRANCIS DELAFIELD, M.D.	329
Clinical Observations on the Cardiac Bruits of Chlorosis. By ALFRED G. BARRS, M.D., M.R.C.P.	347
A Case of Elephantiasis of the Scrotum. By CHRISTIAN FENGER, M.D.	352
Responses to the Alternating Current in Normal and Degenerate Muscles. By M. ALLEN STARR, M.D., and CHARLES I. YOUNG, A.B.	361
The Possible Results of Cæsarean Delivery. By ROBERT P. HARRIS, A.M., M.D.	371
Contributions to the Normal and Pathological Histology of the Fallopian Tubes. By J. WHITRIDGE WILLIAMS, M.D.	377

REVIEWS.

A Practical Treatise on Diseases of the Skin. By Henry G. Piffard, A.M., M.D.	389
Diabetes: Its Causes, Symptoms and Treatment. By Charles W. Purdy, M.D.	392
Text-book of Ophthalmoscopy. By Edward G. Loring, M.D.	395
Hypnotism and Ancient Beliefs. By Dr. L. R. Regnier	396
Complete Works of J. M. Charcot. Cerebral Hemorrhage and Softening, Metallotherapy and Hypnotism, Electrotherapy	398

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

	PAGE		PAGE
On the Preparation and Use of Ointments in Diseases of the Skin	399	Removal of Superfluous Hair	404
The Toxicity of Salol	403	For Corns and Warts	405
Naphthaline as a Vermifuge	403	Menthol in Hay Fever	405
The Use of Pure Benzole in Whooping-cough	403	Common Thyme in Whooping-cough	405
Antipyrine as a Hæmostatic	404	Hypodermic Injections of Strychnine in Ten Cases of Chronic Alcoholism	405

MEDICINE.

The Nature, Action, and Therapeutic Value of the Active Principles of Tuberculin	406	Osteomalacia in Insane Patients	409
Local Miliary Tuberculosis in the Course of Treatment with Tuberculin	409	Allochiria	411
		Albuminuria	412
		Danger of Breaking-down Capsules about Colonies of Bacilli	412

SURGERY.

Supposed Curative Effect of Operations, <i>per se</i>	413	Deep Urethral Medication in the Treatment of Urethral Catarrh	418
---	-----	---	-----

OTOLOGY.

	PAGE		PAGE
Operation for the Relief of Deafness, Noises in the Head and Ears, and Vertigo, Due to Chronic Catarrh of the Drum of the Ear	421	Use of Collodion in Relaxation of the Membrana Tympani	422
A New Modification in Borie Acid Treatment of Chronic Suppurative Otitis Media	421	Forms of Otitis Media Purulenta in Tuberculous Subjects	422
Ménière's Vertigo and the Semicir- cular Canals	422	Hemorrhages into the Labyrinth in Consequence of Pernicious Anæmia	423
Auditory Affections in Tabes Dorsalis	422	The Importance of Surgical Means Applied to the Naso-pharynx in the Relief of Naso-pharyngeal and Middle Ear Disease	423

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

Morbid Growths of the Larynx	424	Wounds of the Larynx	427
Foreign Bodies in the Larynx	426	Fraeture of the Larynx	427

DERMATOLOGY.

Psorospermose Folliculaire Végétante (Darier)	428	Report of a Case of Lupus Vulgaris Treated with Koch's Tuberculin	430
Application of Drying-in Liniments (Linimenta Exsiccantia) in the Treatment of Skin Diseases	429	Lupus Vulgaris Treated with Tuber- eulin; Death Results	430
Bassorin Paste: a New Base for Der- matological Preparations	429	A Clinical Study of Pruritus Hiemalis	431
An Extensive Case of Favus	430	Observations on Two Cases of Lupus Treated by Koch's Tuberculin	431

OBSTETRICS.

Perforation of the Uterus Following an Intra-uterine Douche; Subli- mate Poisoning	432	Knots in the Cord in Twin Pregnaneies	433
Puerperal Psychoses, with Reference to Eclampsia	432	Pregnancy Complicated by Fibro-cyst of the Ovarian Ligament; Ectopic Pregnancy, Treated by Laparotomy	433
The Protection of the Perineum Dur- ing the Passage of the Shoulders	433	The Development of the Placenta	434
		Maternal Impression Followed by the Production of a Monster	434

GYNECOLOGY.

The Action of the Galvanic Current upon Uterine Fibroids	434	The Results of High Amputation of the Cervix Uteri for Cancer	436
Fibroma of the Ovary	435	The After-treatment of Laparotomy	437
Abdominal Extirpation of the Fibroid Uterus	435	The Condition of the Ovaries in Cases of Fibro-myoma	437
The Ultimate Results of Vaginal Hys- terectomy for Cancer	436	The Influence of the Climaeterie upon Fibro-myomata	438

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OCTOBER, 1891.

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BY FRANCIS DELAFIELD, M.D., LL.D.,
OF NEW YORK.

OUR notions concerning the nature of diseases and their treatment are greatly influenced by names and classifications. So, as our knowledge becomes more accurate, it is important, as fast as may be, to modify and change such names and classifications as have become a hindrance instead of a help.

The ordinary history of such names is that during the earlier periods of medicine some man more able than his fellows was able to group together a number of cases of diseases, to describe them plainly and to venture some theory as to their nature. Such a group of diseases then became known by the name of its describer, or by some arbitrary term. As time went on such a name acquired the dignity of use and custom, became generally accepted, and more and more traditions and classical descriptions accumulated about it, until in men's minds were established a name and a clinical picture to which, as to a Procrustean bed, they compelled their cases to correspond. With the further progress of medicine came the fresh study of the old diseases and the discovery that much could be seen and demonstrated which it was difficult to reconcile with the old traditions. Then came an unsatisfactory period during which the old name was retained as expressing a real entity, and the attempt was made to divide and classify the varieties of this entity. Lastly comes the time when the old name is retained as a popular term, but it is recognized that it does not really designate a distinct form of disease. Such has

been the history of such names as "cancer," "phthisis," and "Bright's disease."

I believe that the time has fully come to abandon the idea that there is such a disease as Bright's disease, and to cease from the attempt to describe varieties of a disease that does not exist. When we have divested our minds of this tradition we can begin to study the diseases of the kidneys and to try to classify them.

There seem to be three ways in which we can classify kidney diseases—according to their causes, according to the part of the kidney involved, or according to the nature of the morbid process.

The attempt to classify kidney diseases according to their causes is, in the present state of our knowledge, simply impossible.

The attempt to classify them according to the part of the kidney involved, to describe tubal nephritis, glomerulo-nephritis, interstitial nephritis, and arterio sclerosis, has been made many times. It has never given us a classification of any practical use for clinical purposes.

A classification according to the nature of the morbid process is altogether the most promising.

There are three morbid processes which occur in nearly every part of the body, which produce definite anatomical changes, cause regular clinical symptoms, and call for appropriate methods of treatment. These morbid processes are congestion, degeneration, and inflammation.

Congestion, whether acute or chronic, produces an accumulation of blood in the veins and capillaries of the part affected, causes local symptoms and disturbances of function, and is to be relieved by means addressed to the circulation of the blood.

Degeneration, whether acute or chronic, produces changes more or less profound in the parts affected; is regularly caused by poisons, by disturbances of circulation, and by other diseases; produces disturbances of function according to its severity; may be itself a cause of inflammation, and can be but little affected by any treatment.

Inflammation is attended with three essential features, which may occur separately or together—an escape of the elements of the blood from the vessels, a formation of new tissue, and a death of tissue. So we speak of exudative, productive, and necrotic inflammations.

Exudative inflammation is of short duration, leaves behind it no permanent changes in the parts affected, and can be favorably affected by treatment.

Productive inflammation runs an acute, subacute, or chronic course. It effects permanent changes in the inflamed parts. Its acute forms are very apt to become chronic. There is much variety as to the relative quantity of exudation and of new tissue. Treatment is not very satisfactory.

The different forms of kidney disease which are commonly included

under the name of Bright's disease can all be conveniently classified under the heads of—

Congestion of the kidney.

Degeneration of the kidney.

Inflammation of the kidney.

Such a classification has the merit of being simple and easily understood, of resting on an anatomical basis, and of being of practical use for clinical purposes.

I. THE CONGESTIONS OF THE KIDNEY.

These are naturally divided into acute and chronic congestions. They must always depend upon causes which affect the circulation and cause an accumulation of venous blood in the kidney.

Acute congestion of the kidney is produced by the ingestion of poisons, by extirpation of one kidney, by injuries, by surgical operations, and by unknown causes.

It may occur in kidneys previously normal, or in those already diseased.

The most marked symptom is the diminution or suppression of the urine, but albumin and casts may be present.

Such an acute congestion is a transitory condition, but when it occurs with injuries and with surgical operations it may apparently be a cause of death.

Chronic congestion of the kidneys is produced by some long-continued mechanical interference with the circulation of the blood, an interference which necessarily causes congestion of other parts of the body as well as of the kidneys.

The characteristic changes in the kidneys are: Swelling or flattening of the epithelium of the cortex tubes, dilatation and thickening of the capillaries of the glomeruli, congestion and dilatation of the pyramid veins.

The urine is more or less diminished in quantity according to the intensity of the congestion.

The specific gravity is from 1.020 to 1.025, but it may for a time fall to 1.010 or rise to 1.035. The excretion of urea is usually ten grains to the ounce; it may rise to twenty-one grains. Albumin and casts are absent, or only present in very small quantities. The bad results of chronic congestion are the diminished production of urine and the liability to the supervention of chronic nephritis.

II. DEGENERATION OF THE KIDNEYS.

Degeneration of the kidney is always a secondary process produced by the introduction into the body of inorganic poisons or of the poisons of the infectious diseases, or by the effect produced on the body by

chronic diseases or vicious modes of life, or by disturbances of the circulation.

There are no changes in the kidneys except in the renal epithelium. In these cells are developed a variety of degenerative and necrotic changes.

It may happen that these degenerative changes are developed so rapidly that the bloodvessels are irritated, and there are added congestion and exudation of serum. We include, therefore, in this class both those kidneys the seat of degeneration alone, and those in which both degenerative and exudative inflammation exist, but the inflammation is secondary and subordinate to the degeneration.

Acute degeneration of the kidneys is found almost constantly with the infectious diseases and with poisoning by arsenic, phosphorus and mercury. It occurs in many different degrees of severity, and so we find the renal epithelium: merely swollen and granular, or infiltrated with granules, or broken and disintegrated, or in the condition of coagulation necrosis.

In correspondence with the degree of the degeneration of the renal epithelium is the severity of the clinical symptoms.

The urine is unchanged, or its quantity is diminished, or it contains a little albumin, or the albumin is abundant with casts and red and white blood-cells.

Many of the examples of this lesion are of so mild a type that they have no symptoms except the changes in the urine. The severe forms are dangerous to life; but dropsy and disturbances of the circulation are not associated with them.

Acute degeneration, therefore, includes a well-defined set of cases, definite in their lesions, their causes, their symptoms, and evidently not likely to be influenced by any treatment.

Chronic degeneration of the kidney is produced by the same mechanical causes as those which produce chronic congestion, by chronic alcoholism and by vicious modes of life. It is, therefore, always a secondary lesion.

The only changes in the kidney are in the epithelium of the tubes, of which the cells are swollen, granular, and infiltrated with fat. But if the degeneration is due to chronic congestion, there will also be changes in the glomeruli.

The quantity of the urine varies at different times in the same case and also in different cases; it may be abundant, scanty, or suppressed. Albumin and casts in moderate quantities are often present, but the specific gravity is not lowered.

Such a degeneration of the kidneys has a decided effect upon the health and nutrition of the patients. They lose flesh and strength, become anæmic, and finally pass into the typhoid state with delirium

There was great thinning of the lids and retraction into the orbit owing to atrophy of the orbital tissues.

The other two cases differed in this way that in both some slight degree of ptosis had existed from birth, and had since developed more completely. In them there was also an hereditary tendency to ptosis which, however, was not very strong in either case. They constituted, therefore, as it were, a transition from the congenital to the acquired ptosis.

In discussing the probable nature of these cases of ptosis, Fuchs points out first, that there could be no question of a paresis of the sympathetic or of a trauma. They must either be due to paralysis of the nerve-fibres supplying the levators or to changes in the muscles themselves. It is certainly rare, though it may occur, that a true nerve paralysis is confined to the levators alone, but there are good reasons for not considering the group of cases described to be due to paralysis. First, because if peripheral there would not be ptosis alone.

Again it is difficult to imagine that they could be central as there is no known centre for the two levators and a bilateral nuclear paralysis confined to the levator nuclei, even supposing distinct nuclei to exist for their muscles, would be extremely unlikely.

On the other hand, it is well established that in cases of congenital ptosis there may be an absence or defective development of the muscles. Fuchs indeed considers his cases to be cases of *atrophy of the levators* for the following reasons: (1) On account of the very slow access of the ptosis, there being even after years some slight yet undoubted contractility of the muscle remaining before all power is lost. (2) Because of the co-existing atrophy of the other parts of the lid, and lastly because some cases are preceded by a slight congenital drooping.

A portion of muscle removed from one case during the performance of an operation for raising the lid (Pana's operation) provided an opportunity of making a microscopical examination; the result of this, however, did not admit of a conclusion as to whether the primary atrophy of the muscles was neuropathic or myopathic in its origin.—*Graefe's Archiv.* xxxvi. 1.

NEW TREATMENT OF SYMPATHETIC OPHTHALMITIS.

DR. ABADIE, of Paris, partly from theoretical considerations suggested by the now very generally accepted view that sympathetic ophthalmitis is micro-organismal in its nature, and partly owing to the success which he claims has attended the practice where it has been tried, recommends the following treatment in cases of threatened or actual sympathetic mischief. In the first place enucleation, formerly so freely resorted to, should, in his opinion, be reserved for very exceptional cases in which the injury to the eye has been so severe as to leave no possibility of any vision being restored. Even in cases of very serious injury, in which, notwithstanding the adoption of antiseptic precautions, a sympathetic ophthalmitis has resulted, Dr. Abadie, before proceeding to enucleation, recommends the use of the actual cautery applied freely to the wound, followed by the injection of one or two drops of a solution of corrosive sublimate (1:1000) into the eye. In this way he has succeeded frequently not only in checking the sympathetic inflammation, but in improving the state of the exciting eye as well.

infiltrated with serum, the kidney is succulent and wet; if the number of pus-cells is very great, there will be little whitish foci in the cortex.

In such kidneys we find the evidences of exudative inflammation in the tubes, the stroma, and the glomeruli, all the changes being most marked in the cortical portion of the kidney.

The epithelium of the convoluted tubes is often simply flattened. As this same appearance is also found in the chronic congestion of heart disease, it seems probable that this change of the shape of the cells is merely due to the inflammatory congestion.

In other cases, not only is the epithelium flattened but there is also a real dilatation of the cortex-tubes. This dilatation does not involve groups of tubes, but all the cortex-tubes uniformly. In other cases, the epithelium of the convoluted tubes is swollen, opaque, degenerated, and detached from the tubes. But in fresh kidneys, properly preserved, this degeneration and desquamation of the epithelium is not nearly as constant or as marked a feature as would be supposed from the descriptions of some English observers. The tubes, whether with flattened epithelium or dilated, may be empty. More frequently, however, they contain coagulated matter in the form of irregular masses and of hyaline cylinders. The irregular masses are found principally in the convoluted tubes; they seem to be formed by a coagulation of substances contained in the exuded blood-plasma, and are not to be confounded with the hyaline globules so often found in normal convoluted tubes. The cylinders are more numerous in the straight tubes, but are also found in the convoluted tubes.

They also are evidently formed of matter coagulated from the exuded blood-plasma, and are identical with the casts found in the urine. The tubes may also contain red and white blood-cells.

In the cases in which there is an excessive emigration of white blood-cells, we find these cells in the tubes, in the stroma, or distending the capillary veins. This excessive emigration is not necessarily attended with exudation of the blood-serum, and so the urine of these patients may contain no albumin. The white blood-cells are not usually found equally diffused through the kidneys, but are collected in foci in the cortex. These foci may be very minute, or may attain a considerable size.

In the glomeruli we find changes which, at first sight, seem peculiar, but are really similar to the changes which we find in arteries and capillaries in many inflamed tissues. The cavities of the capsules may contain coagulated matter and white and red blood-cells, just as do the tubes. The capsular epithelium may be swollen, sometimes so much so as to resemble the tubular epithelium, and this change is most marked in the capsular epithelium near the entrance of the tubes.

The most noticeable change, however, is in the capillary tufts of the

and stupor. Dropsy and disturbances of the circulation are not associated with this form of kidney disease. As the kidney lesion is always secondary to some other serious morbid condition, it is often difficult to tell how much of the loss of health is due to the primary disease and how much to the change in the kidneys.

III. THE INFLAMMATIONS OF THE KIDNEY.

These are naturally subdivided into—

- A. Acute exudative nephritis.
 - B. Acute productive or diffuse nephritis.
 - C. Chronic productive or diffuse nephritis with exudation.
 - D. Chronic productive or diffuse nephritis without exudation.
- Suppurative nephritis.
Tubercular nephritis.

A. *Acute Exudative Nephritis*.—This is an acute inflammation of the kidney, characterized by congestion, an exudation of plasma, an emigration of white blood-cells, and a diapedesis of red blood-cells from the vessels; to which may be added swelling or necrosis of the renal epithelium and changes in the glomeruli.

Of such a nephritis we may distinguish three varieties:

1. A mild form, which gives symptoms during life, but leaves no lesions in the kidney after death.
2. A more severe form, in which we find inflammatory changes in the kidney after death.
3. A form characterized by the excessive production of pus-cells.

Lesions. In a nephritis of this type we should expect that the inflammatory products, the serum, white and red blood-cells, and coagulable matter from the blood-plasma, would collect in the Malpighian bodies and tubes or infiltrate the stroma between the tubes; and that of the inflammatory products in the tubes and Malpighian bodies a part would be discharged with the urine and a part found in the kidney after death. We should also expect that the quantity of inflammatory products would be in proportion to the severity of the inflammation, and that an excessive number of pus-cells would belong to the especially severe forms of the disease. Still further it is evident that, with the milder examples of nephritis, with but little exudation, no inflammatory products might be found in the kidney after death, all having been discharged into the urine during life.

As a matter of fact, the kidneys do present just such changes. In the mild cases we find no decided lesions in the kidney after death. In the more severe cases the kidneys are increased in size, their surfaces are smooth, the cortical portion is thick and white, or white mottled with red, or the entire kidney is intensely congested. If the stroma is

number of casts and quantity of coagulated matter found in the corresponding kidneys after death.

In addition to the changes in the quantity and composition of the urine, the patients present constitutional symptoms which vary, in the different cases, as to their number and their severity. A febrile movement, with more or less prostration; stupor, headache, sleeplessness, restlessness, muscular twitchings, and general convulsions; dyspnoea, loss of appetite, nausea, and vomiting; a pulse of high tension with exaggerated heart-action, or hypertrophy of the left ventricle, dropsy and anæmia—these may be called the characteristic symptoms of acute exudative nephritis. Of these symptoms a certain number—the fever, the prostration, the loss of appetite and nausea, the anæmia, the diminution in the quantity of urine, the albumin and casts in the urine—are such as would naturally accompany an acute inflammation of the kidney, and very often they are the only symptoms which do accompany it.

But with this same kidney lesion a certain number of patients will present, besides the symptoms just mentioned, the additional features of cerebral symptoms, changes in the heart and circulation, and dropsy. We indeed might think that the cerebral symptoms and the dropsy were due to the diminished excretion of urine; but when these conditions occur, as they often do, in patients who are passing large quantities of urine of good specific gravity, and when they are absent, as they often are, in patients who are hardly passing any urine at all, it is evident that these symptoms are not directly due to the nephritis, but constitute a separate, complicating set of symptoms, which may be present or absent in any given case of the disease.

What the complicating lesion is which produces these symptoms we do not fully know; but the changes in the action of the heart and the dropsy naturally direct our attention to the arteries and capillaries, with the expectation of finding in them some morbid condition which will hinder the passage of the blood through them. Whether the morbid condition is of an inflammatory nature, or whether it is only a spasmodic contraction, we are as yet ignorant.

The cases of exudative nephritis, with an excessive production of pus-cells, have a somewhat different clinical history. Such a nephritis occurs both in children and adults; it may be primary, or complicate scarlatina, diphtheria, or measles.

The invasion is sudden, with a high temperature and marked prostration. Restlessness, delirium, headache, and stupor are soon developed and continue throughout the disease. The patients lose flesh and strength and pass into the typhoid state. Dropsy is slight or absent altogether. The urine is not so much diminished in quantity as one would expect; its specific gravity is not changed; albumin, casts, and red and white

glomeruli. These capillaries are normally covered on their outer surfaces by flat, nucleated cells, so that the tuft is not made up of naked capillaries, but each separate capillary throughout its entire length is covered over with these cells. There are also flat cells which line the inner surfaces of the capillaries, although not uniformly, as is the case in capillaries in other parts of the body. Still, in spite of the presence of all these cells, the outlines of the walls of the capillaries are fairly distinct.

In exudative nephritis the swelling and growth of cells on and in the capillaries change the appearance of the glomeruli. They are larger more opaque; the outlines of the main divisions of the tuft are visible, but those of the individual capillaries are lost. It is difficult to tell how much these changes in the glomeruli interfere with the passage of the blood through their capillaries. In most cases of exudative nephritis the patients recover and the glomeruli return to their natural condition.

In some examples of exudative nephritis we also find a thickening of the walls of the branches of the renal artery within the kidney. This thickening is principally due to a swelling of the muscle-cells in the walls of these vessels.

Etiology. Acute exudative nephritis is frequently a primary disease, either occurring after exposure to cold, or without discoverable cause. It complicates scarlatina, measles, diphtheria, typhoid fever, acute general tuberculosis, pneumonia, acute peritonitis, dysentery, erysipelas, diabetes, and many other of the infectious diseases and severe inflammations. It is one of the forms of nephritis which complicate the puerperal condition.

Symptoms. In the milder cases the only symptoms are the changes in the urine. This is somewhat diminished in quantity, of normal or high specific gravity; it contains albumin in moderate quantities, a few casts, sometimes blood.

In the more severe cases the changes in the urine are more decided. It is diminished in quantity, or even suppressed; its specific gravity is normal or high; the quantity of albumin is very large; the casts are numerous, hyaline, granular, containing white or red blood-cells or epithelium; there are also free white and red blood-cells and epithelial cells from the kidney and the bladder. As a rule, the quantity of albumin and the number of casts are in proportion to the severity of the nephritis, but this is not always the case. Large quantities of albumin, numerous casts, and many white and red blood-cells may be found in the urine of kidneys which, after death, show no structural changes; while, on the other hand, small quantities of albumin and a few hyaline casts are compatible with a severe nephritis. Still further, the number of casts found in the urine during life is not always in proportion to the

basement substance. The tubes seem to become compressed and atrophied between the new tissue.

In each wedge is one or more of the arteries which run up into the cortex and give off the little branches ending in glomeruli. The walls of these arteries are thickened.

The glomeruli belonging to these arteries become the seat of changes of a permanent character. There is the same growth of the cells covering the vessels, and of the cells within them, as in exudative nephritis, reaching even a greater development. In addition, there is a growth of the cells lining the capsules to such a degree as to form a mass of cells compressing the tuft. The tuft apparently never returns again to its natural condition, but, as time goes on, the vessels are obliterated, the capsule-cells are changed into connective tissue, and the glomeruli are finally transformed into little balls of fibrous tissue.

Symptoms. The urine during the acute periods of the nephritis is scanty, colored by blood, of high specific gravity. It contains much albumin, numerous casts of all kinds, and red and white blood-cells. Exceptionally, the casts are few or absent. Later in the disease, or when it is of a more subacute type, the urine is more abundant, the specific gravity falls, the albumin and the casts continue. In the protracted cases the albumin and casts may for a time diminish or even disappear.

The patients develop all the symptoms which we are accustomed to associate with Bright's disease—headache, restlessness, neuralgic pains, delirium, stupor, coma, muscular twitchings and general convulsions, dyspnoea and cough, loss of appetite, nausea and vomiting, neuro-retinitis, diarrhoea, increased arterial tension and hypertrophy of the left ventricle of the heart, anæmia, loss of flesh and strength, and dropsy, often developed to an extreme degree.

The course of the disease varies with the intensity with which it is developed and the rapidity with which it proceeds.

The invasion may be sudden, the symptoms marked, and the duration of the disease short, with a fatal termination; or, with the same acute invasion, the disease may be protracted over many months; or the invasion may be gradual, the course of the disease subacute, the symptoms not continuous, but with periods of improvement or even apparent recovery, and the duration of the disease protracted for months and years.

The *prognosis* of this form of nephritis is bad. The lesion is a permanent and progressive one. It is, indeed, apparently possible to recover from it, although with damaged kidneys, but this is the exception. The rule is that, sooner or later, the disease proves fatal, although it may well happen that periods of improvement give rise to false hopes of recovery.

blood-cells are present in considerable quantities, but not always early in the disease, and may even be absent altogether.

Prognosis. It is a very fatal form of nephritis, and yet one easily misunderstood on account of the resemblance of its symptoms to those of an acute meningitis.

B. Acute Productive or Diffuse Nephritis.—This is the most serious and important of all the forms of acute nephritis, not only for the reason that it involves so many of the structures of the kidney, but because its lesions are from the first of a permanent character, and because disturbances of the circulation are so frequently associated with it. It is one of the forms of scarlatinal nephritis; it occurs early and late in the course of diphtheria; it is the most important variety of the nephritis of pregnancy, and it is especially frequent as a primary nephritis with or without a history of exposure to cold.

Lesions. The changes in the kidneys are extensive and well marked.

The kidneys are large, at first smooth, later sometimes a little roughened; the cortical portion is thick, white, or mottled with yellow or red, or congested; the pyramids are red.

In these kidneys we find the same lesions as have been described as belonging to exudative nephritis, but with two additional changes—changes which are found in the earliest stages of the inflammation and which give the characteristic stamp to the lesion; first, a growth of connective tissue in the stroma; second, a growth of the capsule-cells of the Malpighian bodies. Both these changes do not involve the whole kidney, but symmetrical strips or wedges in the cortex, which follow the line of the arteries. These wedges are small or large, few or numerous, regular or irregular, in the different kidneys. But in every wedge we find the same general characters: one or more arteries of which the walls are thickened; the Malpighian bodies belonging to this artery show an enormous growth of capsule-cells, with compression of the tufts; running parallel to these arteries a growth of connective-tissue cells and basement substance in the stroma. Between the wedges we find at first only the changes of exudative nephritis; later, a growth of diffuse connective tissue. Sometimes we find these wedges small, symmetrical, and at considerable distances from each other; more frequently they are much closer together, sometimes even becoming continuous.

If the nephritis is of acute type and recent, the new tissue between the tubes consists largely of cells; if the nephritis is of subacute type and longer duration, the tissue is denser and has more basement substance. Where the growth of new tissue is abundant, the tubes become small and atrophied.

In the wedges the constant change is the growth of new tissue in the stroma between the tubes, not an infiltration of the stroma with pus-cells, as in an exudative nephritis, but a new growth of cells and of

uniform mass of dense connective tissue, or there is waxy degeneration of the walls of the artery.

Causes. This form of nephritis occurs very frequently as a primary disease, especially in young adults. It follows acute diffuse nephritis, chronic congestion and chronic degeneration of the kidney. It may complicate syphilis, chronic phthisis, chronic endocarditis, prolonged suppuration, and chronic inflammation of the bones and joints.

Symptoms. The urine varies in quantity at different times. When the nephritis is most quiescent the quantity of urine is normal. During the exacerbations of the nephritis the urine is scanty or suppressed. When the patients are doing badly, often when they are dropsical, the quantity of urine is very much increased.

The specific gravity and the proportion of urea to the ounce of urine slowly diminish. In the cases of shorter duration the specific gravity is apt to run between 1.012 and 1.020. In the very chronic cases it will be between 1.001 and 1.005. Very low specific gravities regularly indicate a large growth of connective tissue in the stroma of the cortex, or waxy degeneration of the capillaries of the glomeruli.

The urine regularly contains albumin and casts. During the active periods of the disease the quantity of albumin is very large; during its quiescent periods it is smaller, and at times may entirely disappear. The number of casts varies in proportion to the quantity of albumin, but occasional exceptions to this rule are seen.

Dropsy may be considered a regular symptom of chronic exudative nephritis. It is rare to find a patient who goes through the disease without exhibiting this symptom. It may be developed at any time in the disease, continue uninterruptedly, or occur only in attacks. A peculiar pallor of the skin and white color of the sclerotic is seldom absent, and is quite characteristic of the disease. It corresponds to a diminution in the quantity of hæmoglobin and in the number of the red blood-cells. These changes in the blood are not, as a rule, far advanced; but sometimes they are, and some cases even die with the symptoms of pernicious anæmia.

Many of the patients are troubled with headache and sleeplessness. Acute uræmic attacks, with contraction of the arteries, convulsions, etc., may occur in the course of a chronic exudative nephritis, but they are of very much more frequent occurrence with the non-exudative form of the disease.

Chronic uræmia, on the contrary, is one of the ordinary ways in which an exudative nephritis proves fatal. The patients pass into a condition of alternating delirium and stupor, with a rapid, feeble, soft pulse.

Simple neuro-retinitis or nephritic retinitis are developed in a moderate number of cases.

c. *Chronic Productive, or Diffuse Nephritis with Exudation*.—Although it is convenient to describe two forms of chronic nephritis—one with exudation and one without—yet it must be remembered that these are not separate lesions of the kidneys, but varieties of the same lesion. For, in all these kidneys, one form of inflammation—productive, with the formation of new tissue—is present. The exudation from the vessels is something which is added to this, but does not change it.

In speaking of the exudation of serum from the vessels and its presence in the urine, we speak of it as it occurs during the whole course of the disease, and not as it occurs for short periods.

We mean that in an exudative chronic nephritis there is usually a large quantity of albumin in the urine, but that in the protracted cases there may be periods during which the albumin diminishes or entirely disappears. In the same way in a non-exudative nephritis there may be periods during which albumin is present in considerable quantities. Generally speaking, the character of the clinical symptoms will vary with the presence or absence of the albumin.

Lesions. In chronic nephritis with exudation the size of the kidney is usually increased; there is a very extensive growth of connective tissue in the cortex; the renal epithelium is swollen, granular, degenerated, fatty, broken, or flattened; the tubes contain coagulated matter, cast matter or blood; the cortex tubes are atrophied in some places, dilated in others.

The glomeruli are changed in several different ways:

1. There is a growth of the capsule-cells in such numbers that they compress the tufts. The cells covering the capillaries are also increased in size and number. The capsule-cells may finally be changed into connective tissue and the tufts become atrophied.

2. The glomeruli are of large size, the cells covering the capillaries are increased in number so that the outlines of the capillaries are lost, but yet the capillaries are not compressed nor the glomeruli atrophied.

3. There is a growth of the cells which cover the capillaries and of the cells within them. Of the cells which cover the capillaries the cell-bodies become very large, the capillaries are compressed, and the glomeruli eventually become atrophied.

4. The walls of the capillary vessels become the seat of waxy degeneration, while the cells which cover them are increased in size and number.

5. If the nephritis follows chronic congestion, the capillaries are dilated and there is an increase in the size and number of the cells which cover the capillaries.

The arteries remain unchanged, or they are the seat of obliterating endarteritis, or there is a symmetrical thickening of all the coats of the artery, or all the coats of the artery are thickened and converted into a

D. Chronic Diffuse Nephritis without Exudation.—Lesions. The larger number of these kidneys are found after death to be diminished in size; the two kidneys together may not weigh more than two ounces. The capsules are adherent, their surfaces are roughened or nodular, the cortex is thin and of red or gray color. A considerable number of the kidneys do not differ in their size or appearance from normal kidneys, except that the capsules are adherent and the surfaces of the kidneys roughened.

Many examples of chronic non-exudative nephritis follow chronic congestion. The kidneys then remain hard, but the cortex becomes thinned, the capsules adherent, and the surface roughened. Some of the kidneys, instead of becoming atrophied, are increased in size, weighing together from sixteen to thirty-two ounces. The surfaces of these large kidneys may be smooth or nodular; the cortex is thickened, its color is red, gray, or white. There is regularly a growth of new connective tissue in the cortex and also in the pyramids, which becomes more and more marked as the disease goes on. In the cortex the new tissue follows the distribution of the normal subcapsular areas of connective tissue, is in the form of irregular masses, or is distributed diffusely between the tubes. In the pyramids the growth of new connective tissue is diffuse.

The tubes, both in the cortex and pyramids, undergo marked changes. Those included in the masses of connective tissue are diminished in size; their epithelium is flattened, some contain cast matter, many are obliterated. The tubes between the masses of new connective tissue are more or less dilated; their epithelium is flattened, cuboidal, swollen, degenerated, or fatty. The dilatation of the tubes may reach such a point as to form cysts of some size, which contain fluid, or coagulated matter. These cysts follow the lines of groups of tubes, or are situated near the capsules.

Of the glomeruli a certain number remain of normal size, but with the tuft-cells swollen, or multiplied. Many others are found in all stages of atrophy until they are converted into little fibrous balls. The atrophy seems to depend partly on the growth of tuft-cells and intracapillary cells, partly on the thickening of the capsules, partly on the occlusion of the arteries. If the chronic nephritis follows chronic congestion the glomeruli remain large, but with a marked growth of tuft-cells; or they become atrophied, but with the dilatation of the capillaries still evident. The capillaries of the glomeruli may be the seat of waxy degeneration.

The arteries exhibit the same changes as are found in chronic exudative nephritis.

Complicating lesions. Hypertrophy of the left ventricle of the heart is frequently caused by exudative nephritis, but still more frequently by the non-exudative form; but it must be admitted that such an hyper-

Dyspnœa is a nearly constant symptom, but it is not always the same kind of dyspnœa, nor always produced by the same cause. It may be due to hydrothorax, to œdema of the lungs, to contraction of the arteries, or to failure of the heart's action.

In many patients the dyspnœa due to contraction of the arteries, or to failure of the heart's action, is the first symptom which attracts attention. It is a dyspnœa which comes on in attacks, especially at night and in the early morning, and is regularly worse when the patient lies down. It often begins while the patient is apparently in good health, but it is a sure premonition of serious disease.

A catarrhal bronchitis with cough and expectoration is often present.

Loss of appetite, nausea, and vomiting are frequent symptoms.

The heart is often affected. There may be hypertrophy of the left ventricle, dilatation of both ventricles, chronic endocarditis, myocarditis, or a feeble heart.

Course of the disease. There is hardly any limit to the variety of the disease, but the most constant symptoms are anæmia, dropsy, and albumin in the urine.

1. There are cases in which the symptoms are nearly continuous, the patients get steadily worse and die within one or two years. The anæmia, the dropsy, and the albumin are constantly present, and the patients die with dropsy or with chronic uræmia.

2. There are cases in which the anæmia, the dropsy, and the dyspnœa come on in attacks which last for weeks or months. Between the attacks the patients are comparatively well, often able to work, although the urine always contains albumin.

3. There are cases in which a number of years before death the patient has an attack of dropsy, etc., from which he apparently recovers and goes on able to work, but with urine of low specific gravity, which sometimes contains albumin. After an interval of many years comes the fatal attack with all the characteristic symptoms.

4. There are cases which for years have no symptoms but pallor of the skin and urine of low specific gravity containing albumin. These patients often for a long time feel so well that they cannot understand that they have a serious disease.

5. There are cases in which the first symptom is the attack of spasmodic dyspnœa, the patients otherwise feeling well. It may be months or years before the other symptoms are developed.

6. There may be a history of chronic endocarditis lasting for years before the renal symptoms are developed.

7. There are cases which apparently recover from the disease.

The *prognosis* is bad, but life may be prolonged for many years with but few symptoms, and recovery seems to be possible.

Finally, in cases where, in spite of everything, *i. e.*, treatment without or by enucleation, the second eye continues to become disorganized, he recommends attempts at hastening the quieting of the process of inflammation by injecting the same solution into the eye before performing any operation. —*Annales d'Oculistique*, April, 1890.

PUPILLARY CHANGES DEPENDENT UPON TUBERCULAR DISEASE OF THE LUNGS.

RAMPOLDI has on several occasions since 1885 published cases of transitory or persistent mydriasis caused, as he believed, by irritation of the sympathetic in connection with pulmonary disease. Such cases have also been described by Comini, who found the mydriasis most frequent on the right side. In his latest communication Rampoldi refers to a case in which he has been able to demonstrate the causal connection by post-mortem examination. In that case there was double myosis, recognized as paralytic owing to the imperfect dilatation of the pupils under atropine. Both inferior cervical ganglia of the sympathetic nerve were found to be diseased. On the right side this was evident to the naked eye, on the left it was first apparent after hardening and microscopic examination. —*Annali di Ottalmologia*, xix. 2.

THE FORM AND SIZE OF THE INTERVAGINAL SPACE OF THE OPTIC NERVE IN THE REGION OF THE CANALIS OPTICUS.

PFISTER (*Graefe's Archiv.*, xxxvi. 1) has recently investigated this point, which is of interest in connection with the relation between brain and eye diseases, and possibly, also, in connection with sympathetic ophthalmitis. The investigation was made under the guidance of Prof. Haab, of Zurich. The portion of the nerve lying in the optic canal was specially chosen, as not only has that portion received little attention, but the statements in regard to it are conflicting. As regards the method of examination: in the first place suitable portions were removed with the saw from specimens which had been left in Müller's fluid for two years. The decalcification, which lasted from two to five weeks, was then effected by means of lactic acid. The acid was afterward removed by forty-eight hours' treatment with running water, and the hardening finally completed in alcohol. The preparations were rendered transparent by being placed in warm aniline oil (40° C.) for six hours. They were then transferred to xylol at the same temperature, the xylol being frequently changed until it ceased to become brown. Finally, they were cut in paraffin and colored in various ways. The result of the examination of specimens treated in this manner was to show, that both in form and extent, the intervaginal space in the optic canal is subject to considerable individual differences. There is always, it appears, a considerable space between the dural and pial sheath. In some it extends right round the nerve, although there are always pretty strong fibrous tissue filaments passing between the two surfaces. In others, again, the two surfaces are at parts completely grown together. This is most frequently the case below in the neighborhood of the superior ophthalmic artery. The dural sheath is very strongly developed throughout and is specially so below.

trophy, although frequent, is not constant, that both with exudative and non-exudative nephritis there may be no change in the wall of the left ventricle. The hypertrophy of the wall of the ventricle may after a time be succeeded by dilatation, or chronic degeneration, or myocarditis.

Chronic endocarditis is very frequently associated with chronic Bright's disease. The valvular lesions may cause chronic congestion, chronic degeneration, or chronic nephritis; or the same patient may suffer from chronic endocarditis, and either form of chronic nephritis, the lesions associated possibly due to the same causes, but not dependent on each other.

Pulmonary emphysema, chronic endocarditis, and cirrhosis of the liver, all of them examples of chronic productive inflammation, frequently accompany chronic nephritis.

With the endarteritis comes the additional danger of cerebral hæmorrhage.

Patients suffering with chronic nephritis are more liable than are other persons to attacks of pericarditis, bronchitis, and gastric catarrh.

Symptoms. The typical urine of chronic non-exudative nephritis is a urine increased in quantity, of a specific gravity of about 1.010, containing a diminished quantity of urea, without albumin or casts, or with a trace of albumin and a very few casts, except during exacerbations of the nephritis, when the quantity of albumin and the number of casts may be considerable. But very important modifications of the urine are of ordinary occurrence. It is quite possible, with nephritis of this type far advanced, to have urine not below 1.020 in specific gravity, and without albumin or casts. In such cases the diagnosis has to be made without reference to the urine. On the other hand, there are cases in which the specific gravity of the urine falls very low, almost to 1.000, either with or without waxy degeneration of the vessels. There are cases in which the quantity of urine is very much increased, several quarts in the twenty-four hours. During the attacks of contraction of the arteries, to which these patients are liable, the urine may be diminished to a few ounces or suppressed.

In a great many of the cases cerebral symptoms are developed at some time in the course of the disease. Headache and sleeplessness are often present, the headache sometimes so severe and continuous that the patient is nearly maniacal; or instead of the headache there are neuralgic pains in the different parts of the body.

Muscular twitchings and general convulsions are much more serious; they may be an early symptom, or not occur until late in the disease.

Hemiplegia, with or without aphasia, may be the first symptom to call attention to the nephritis, or may not occur until late in the disease. The invasion of the hemiplegia is sudden and is usually accompanied by coma. There is loss of motion alone, or of both motion and sensation.

The hemiplegia, coma, and aphasia may continue up to the time of the patient's death, or disappear after a few hours or days. In the latter case the patient may have several such attacks. These attacks have been ascribed to localized œdema of the brain. In the cases which I have seen there were no changes in the brain-tissue, but the cerebral arteries were damaged by chronic endarteritis.

Delirium, mild or violent, stupor, and coma may come on in sudden attacks, or be developed slowly and gradually.

When these cerebral symptoms come on in attacks, the arteries are contracted, the temperature is raised, and the patients are said to suffer from acute uræmia. Very often they recover from a number of these attacks. In the fatal attacks the pulse often loses its tension, but becomes rapid and feeble, and the patients die comatose, with a feeble heart.

Instead of such acute attacks of cerebral symptoms, the symptoms may come gradually in persons already much reduced by the kidney disease. The temperature is then apt to be below the normal, and the pulse is rapid and feeble.

Temporary blindness, neuro-retinitis, or nephritic retinitis, are developed in a moderate number of these patients.

Chronic bronchitis and emphysema very frequently exist, and their symptoms often form a large part of the clinical history.

The left ventricle of the heart is regularly hypertrophied. This by itself gives no symptoms; but if the arteries become contracted, or if the hypertrophied heart becomes feeble, then disturbances of the circulation are established which cause serious symptoms.

In the same way the complicating endocarditis which so often exists gives no trouble until the valves are a good deal changed, or the ventricles dilated, or the heart's action altered, or the arteries contracted; then the circulation is interfered with, and the results of venous congestion of different parts of the body show themselves.

Dyspnœa is a very frequent symptom, often the first symptom noticed by the patient. It is a spasmodic dyspnœa coming on in attacks which last for minutes, hours, or days. It is regularly made worse by mental or bodily exertion, or by the recumbent position. It does not resemble pulmonary asthma. It is apparently due to the association of changes in the arteries and in the heart. With contraction of the arteries alone, or with a feeble heart alone, no dyspnœa may exist; but if the contraction of the arteries is so great that the hypertrophied and laboring heart is unable to overcome the obstruction, or if with the contracted arteries the heart becomes dilated or feeble, then the attacks of dyspnœa begin. At first the attacks are not severe and are of short duration, but if the mechanical conditions which cause them cannot be controlled, they become longer and more distressing.

Perhaps the most striking examples of this dyspnœa are in the patients in whom it is the first symptom of the nephritis. They are apt to be middle-aged or elderly men, often engaged in large financial or commercial enterprises. They profess that they feel quite well and that they can attend to their affairs perfectly, but that they are very much annoyed because early every morning they have an attack of asthma. In spite of their professions of good health, it is evident that they are pale and that they have dyspnœa on exertion. The heart is found to be enlarged, with or without a murmur; its action is either labored or feeble. The pulse is tense. The urine is of a specific gravity of 1.010 to 1.030; it contains no albumin, or only a trace. In the earlier stages of the disease this dyspnœa can be controlled, but later on it is more distressing and difficult to remedy.

The stomach may become the seat of catarrhal gastritis or of spasmodic vomiting. But in some patients it continues to perform its functions fairly well.

Dropsy, as a rule, is absent with non-exudative nephritis, unless it is complicated by chronic endocarditis or cirrhosis of the liver.

Profuse bleeding from atrophied kidneys has been described by Bowlby in three cases.

Regularly, after a time, the nephritis exerts its effect upon the nutrition of the patient, and the flesh and strength are diminished. On the other hand, the patients do not become as pale as they do in exudative nephritis.

Course of the disease. It is characteristic of the chronic productive inflammations of the lungs, the heart, the arteries, the liver, and the kidneys, that, while they often exist as serious and fatal diseases, they also frequently exist as lesions which do not interfere with general good health and long life. This seems to depend, in part at least, on the rapidity with which the inflammatory changes in these different parts of the body are developed. If they are developed slowly enough the functions of the organ continue to be performed, in spite of the new growth of connective tissue in it.

So, with the kidneys, it is common enough to find chronic non-exudative nephritis far advanced in persons who die from accident or intercurrent disease, and have never given symptoms of renal disease.

In the same way we can often observe for years persons who have urine of low specific gravity, an hypertrophied left ventricle of the heart, and occasionally some increase of tension in the arteries, and who yet habitually enjoy very fair health.

But yet these same persons, if they are attacked with pneumonia or pericarditis, or suffer from a severe accident, will often develop serious or even fatal renal symptoms.

A very common form for the disease to take is that of attacks which

are repeated a number of times, each attack worse than the preceding, and the general health more and more impaired between the attacks. During the attacks there are cerebral symptoms more or less severe—headache, sleeplessness, delirium, stupor, coma, convulsions. Dyspnoea may be present or absent. The arteries are contracted, with a tense pulse. There is loss of appetite, nausea, and vomiting. The urine is of low specific gravity and usually contains albumin. Between the attacks the patients at first seem to be fairly well, but later they gradually lose flesh and strength. The urine between the attacks is of low specific gravity and contains little or no albumin. They finally die in one of the attacks, feeble and emaciated.

In some of the patients spasmodic dyspnoea is the first symptom. This can often be controlled for months and years, and the patients then seem to be well. But after a time it is more difficult to manage, and other renal symptoms are added.

In some cases there are no symptoms for a long time, so that persons apparently in good health are attacked without warning by convulsions, coma, delirium, or hemiplegia. They may die in the first attacks or live to go through subsequent ones.

In some cases the only symptoms up to the time of the patient's death are gradual loss of flesh and strength and disturbance of digestion, the patient dying feeble and emaciated. These cases are hard to make out, unless the specific gravity of the urine is low and a little albumin present. Otherwise there is nothing to draw attention to the kidneys as the cause of the illness. Loss of eyesight from nephritic neuro-retinitis may be the first symptom.

The patients may suffer from the symptoms of cardiac disease for years before congestion or degeneration of the kidney is succeeded by chronic nephritis.

In many cases the course of the nephritis is modified by the complicating emphysema, phthisis, endocarditis, endarteritis, or cirrhosis of the liver.

TREATMENT.

Such a classification as that above given of kidney diseases brings with it a rational system of therapeutics.

Acute congestion of the kidneys can be relieved by the application of heat to the surface of the body.

Chronic congestion is best managed by the drugs which stimulate the heart and dilate the arteries.

We evidently have no means at our command by which we can influence acute degeneration of the renal epithelium; fortunately the great majority of the cases of acute degeneration are not serious.

Chronic degeneration also seems to be a condition which we are unable to treat.

In acute exudative and in acute diffuse nephritis the main indications for treatment are to diminish the severity of the nephritis and to regulate the circulation. To diminish the severity of the nephritis we employ cups over the lumbar region, heat over the lumbar region or over the entire body, and the internal use of calomel, sulphate of magnesia, opium, aconite, or digitalis.

The disturbances of the circulation are largely the causes of the cerebral symptoms and of the dropsy. With a laboring heart and contracted arteries we employ the drugs which dilate the arteries—chloral hydrate, opium, nitrate of amyl, and nitro-glycerin—or we diminish the quantity of the blood by venesection, sweating, or purging. With a feeble heart and relaxed arteries we use the cardiac stimulants.

In chronic nephritis climate and mode of life constitute the important parts of the treatment; it is doubtful if drugs exert any effect on the nephritis. A warm, dry climate and an out-of-door life are of the greatest importance. Medical treatment can, however, be employed with advantage for the relief of the anæmia, the dropsy, and the disturbances of circulation.

With the classifications of kidney disease now in common use you are all familiar. You know the number of names employed and the contradictory meanings attached to these names by different authors. Many of you must have experienced the extreme difficulty there has been in teaching students to understand Bright's disease. I leave it to you to determine how far the plan which I have proposed is likely to be of practical use.

CLINICAL OBSERVATIONS ON THE CARDIAC BRUITS OF CHLOROSIS.

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IN the medical out-patient department of the Leeds Infirmary, during the last two and a half years, I have been able to record the presence or absence of cardiac bruits in 205 cases of simple chlorosis. Cardiac bruits were present in 115 cases, and absent in 90 cases.

In the 115 cases in which bruits were present, their locality was recorded as follows:

A systolic bruit, audible at the base only,				in	56 cases
"	"	"	apex	"	13 "
"	"	"	base and apex	"	24 "
"	"	"	base, apex, and back,	"	22 "
					<hr/>
					115 "

So that in 102 cases a bruit, always systolic in time, was heard at the base, wherever else it might be heard, showing the great preponderance of basic bruits over apical bruits pure and simple—a fact in accord with general experience.

The cases in which the systolic bruit was audible at the base, at the apex, and in the back are naturally those which will excite the most interest, and it is to them particularly that I intend the few remarks which follow to apply; at the same time, it will be perceived that whatever can be said of the chlorotic bruit following, in its locality, rhythm and conduction, all the characters of the mitral regurgitant bruit of organic disease must be applicable *pari passu* to all cardiac bruits arising in the chlorotic state.

I may at once assure the reader that I have no intention of launching into any theoretical disquisition upon the causation of the anæmic murmur beyond the little that is necessary to elucidate the important clinical facts, as they seem to me, which these figures put before us.

It is now about three years ago that I became aware of the fact that in a certain proportion of cases of chlorosis a systolic murmur may be heard, not only at the base and apex, but also at the angle of the left scapula and in its immediate neighborhood, and since then I have been careful to note the locality of all bruits heard in cases of that disease, with the result shown in the figures given above.

The bruits were in all cases clear and distinct, though usually of a soft, blowing character, and audible to the students frequenting the out-patient room, so that there could be no reasonable doubt attaching to the observations. But I am quite sure that now and again the anæmic murmur may be observed to come and go, so that at one time it may be audible and at another not so. Hope noticed this fact, for in his work on *Diseases of the Heart*¹ he says, speaking of the inorganic murmur: "The murmur is not constant, but occasional, coming on whenever the circulation is excited, and for exciting it the most trivial causes, as Laennec has observed, are sufficient."

In the crush and hurry of the out-patient rooms it has been impossible, I am sorry to say, for me to record accurately the concomitant conditions of the heart, but there is no doubt that in the cases presenting a bruit audible at the base, the apex, and in the back, marked changes in the character of the impulse and in the locality of the apex-beat were almost always present, indicating dilatation of the ventricle or ventricles and an increased force of the cardiac contraction. So well marked and constant have these changes been, that I have found myself able, with tolerable certainty, to predict the bruits to be heard after placing the hand upon the præcordium. These changes in the cardiac

¹ 1839 ed., p. 106.

chambers, the result of anæmia, were first seriously studied in this country by the late Dr. Pearson Irvine, who made an elaborate communication to the Royal Medical and Chirurgical Society on May 22, 1877,¹ on the subject, in which he stated that "The apex-beat in chlorotics is carried too far outward, is too diffuse, and in this respect corresponds with the general cardiac impulse, which is usually 'slapping' and like that met with in organic disease." This statement is quite in accord with my own observations, the conditions described by Dr. Irvine being most marked in the 22 cases in which the bruit was audible in the back as well as at the apex and base.

Speaking from my own cases, the duration of the cardiac murmur of chlorosis is not long after the patient has been put under efficient treatment by iron. I should say that, *as a rule*, all murmurs have disappeared at the end of three weeks on the average. In the base, apex, and back cases, the order of their disappearance was the reverse of that named, the basic murmur being the last to depart. This seems to suggest what I have no doubt is the fact—that whatever the mechanical conditions giving rise to the bruits may be, the basic bruit is the earliest and mildest result of them, the back bruit the latest and most serious.

In regard to the general conditions attendant upon bruits in chlorosis, I have found it impossible to predict with certainty any cardiac change that may be present from the intensity of the pallor, the duration of the amenorrhœa, or the obstinacy of the constipation—those cases in which the blood-change seemed greatest having sometimes no bruit at all, while those which had a minimum degree of pallor might present bruits audible at the base, apex, and back.

An apex murmur, systolic in time and conducted to the angle of the left scapula, has usually been held to be distinctive of mitral regurgitation; and further, by those who do not agree that mitral regurgitation may take place from functional or recoverable conditions of the mitral orifice and its valve, is also held to be distinctive of organic disease. I well remember that Dr. Fagge always taught that a systolic bruit audible at the apex only might be either organic or inorganic in its origin; but if the murmur was also audible at the angle of the scapula, then there could be no reasonable doubt as to the organic nature of the condition giving rise to the abnormal sound. In his article on "Diseases of the Valves of the Heart,"² Dr. Fagge, after quoting Dr. Bristowe, Dr. Austin Flint, and Dr. Audrew, says: "These authorities believe that there are two criteria which may be applied to the determination of the fact that in a particular case a systolic apex murmur is really due to mitral regurgitation. The criteria are: 1. That the murmur

¹ *Lancet*, June 9, 1877, p. 837.

² *Reynolds' System of Medicine*, vol. iv. p. 643.

should be audible in the left side of the back about the inferior angle of the scapula. 2. That the pulmonary second sound should be intensified." He then says, a little later on in the same article: "My own views with regard to the interpretation of systolic apex murmur may be summed up as follows: 1. If such a murmur be audible in the back, it indicates mitral regurgitation. 2. If such a murmur be heard only at the heart's apex, we are unable at the present time to pronounce any positive opinion as to its cause, etc." I think there can be no doubt, from the title and context of Dr. Fagge's article, that he uses the term "mitral regurgitation" as synonymous with "mitral disease."

Walshe,¹ speaking of hæmic murmurs, says: "They are only in exceptional cases audible below the nipple and never within my experience perceptible as far as the left apex or outward toward the axilla." He says also in a note:² "I have never yet heard in a purely chlorotic woman a murmur having all the characters of a mitral regurgitant one."

I need not produce further evidence to show how strongly it is held that apical murmurs audible in the back always mean organic disease of the mitral valve. On the other hand, I am able to point to twenty-two cases, in twenty of which murmurs identical with those heard in undoubted examples of mitral disease disappeared under treatment in the course of two or three weeks. Nor am I alone in this observation. Dr. Kingston Fowler³ says, after reference to the works of Dr. Walshe and Dr. Hoyden: "Is every patient presenting the signs of mitral regurgitation, a systolic apex murmur conducted to the angle of the scapula and audible in the vertebral groove between the sixth and ninth dorsal vertebræ, to be considered the subject of organic disease of the mitral valve? According to Dr. Hoyden and Dr. Walshe this question must be answered in the affirmative. My own experience points to an exactly opposite conclusion. I have within the last three months seen at least fifteen cases of advanced chlorotic anæmia among my out-patients at the Middlesex and Brompton Hospitals, of whose cases I have careful notes, and in whom I have detected a systolic apex murmur, which has been distinctly audible not at the angle of the left scapula only, but in many at the right also, and in most of which cases the bruits have already disappeared under appropriate treatment. I have long taught that the anæmic murmurs obey the same law as to conductions as those of organic origin, and particularly that the conduction of the systolic apex murmur to the angle of the scapula is no sign of disease of the mitral orifice."

¹ Diseases of the Heart, 4th ed., 1873. Page 86.

² Op. cit., page 89.

³ On the Origin of Anæmic Murmurs. London, 1884. Page 35.

Dr. Broadbent also says:¹ "The occurrence of dilatation of the left ventricle and mitral regurgitation is very common as an effect of anæmia."

I do not attempt to reconcile these conflicting statements and experiences. I am content to accept the fact that an apex murmur audible at the angle of the scapula is not unfrequently to be observed in chlorosis, and also that the bruit disappears under treatment directed to the removal of the blood state, and so cannot well be due to structural changes in the mitral valve.

In two of the twenty-two cases the mitral regurgitant murmur has not yet disappeared, and as the cases have now been under observation for seven and nine months respectively, there is great probability that permanent changes in the heart have taken place. I will very briefly relate the chief points in these two cases.

CASE I.—Rhoda H., aged twenty-two years, came under observation January 7, 1891. She presented all the characteristic symptoms of marked chlorosis, except that she was menstruating regularly, and had not constipation. She had not had any rheumatic manifestation nor chorea. The cardiac action was extremely irregular, but no bruit could be heard on this occasion. She was ordered a perchloride of iron mixture. On February 2d she was improving in appearance and general symptoms. The heart's action was still irregular, and a systolic bruit was heard at the apex only. February 17th: Heart's action quite regular, systolic bruit heard at the apex and at angle of the left scapula. She has taken the iron mixture since January 7th. On March 3d I made a note that I thought the bruit was organic, and ordered her a digitalis mixture and sulphate of iron pills. May 26th: Has taken digitalis and iron regularly since March 3d (eleven weeks); cardiac action very irregular, systolic apex bruit heard occasionally. On July 10th she was reported very ill and unable to attend. Saw her ten days ago. Heart regular. Bruit still present.

I have very little doubt that this case ought to be regarded as one of chlorosis in which the bruit has become permanent, unless, as is quite possible, she is the subject of long-standing mitral disease, and had by accident, as it were, become chlorotic. Stokes¹ narrates a precisely similar case, in which mitral disease was found on post-mortem examination, and says that the combination of organic and anæmic murmurs, especially in young females, is not unfrequent, and it is often difficult to say whether the organic or functional disease has had the initiative. "Under these circumstances we have generally with the symptoms of anæmia the physical sign of a mitral murmur unattended by evidence of hypertrophy of the heart."

CASE II.—Ruth A. R., aged fifteen years, came to the out-patient room on November 18, 1890, with a chlorotic aspect and the usual symp-

¹ The Pulse. London, 1890. Page 160.

² Diseases of the Heart and Aorta. Dublin, 1854. Pages 150, 151.

toms. She had not menstruated. There was no constipation. She had not had any rheumatic manifestation nor chorea. A systolic bruit was heard at the base, apex, and back. She was ordered perchloride of iron in mixture. December 9th: Bruit still audible in all areas. January 13, 1891: Bruit persists in all areas. I made a note on this date that the bruit sounded like an organic bruit. February 24th: Bruit very faint to-day; so much so that I thought it had disappeared, after all. May 26th: Bruit very loud to-day in all areas and rough in character. She has been taking iron continuously since November 18, 1890, and has improved in appearance and has practically no symptoms. (P. S.) July 17th: Bruit still audible in all areas.

Here, then, are two cases in which a bruit indistinguishable from that of mitral regurgitation due to organic valvular disease persists in spite of long-continued treatment directed to the removal of the anæmic state. The observation of them has called to my mind an important and exceedingly interesting paper by Dr. Goodhart¹ on "Anæmia as a Cause of Heart Disease," in which he says that anæmia, by leading to dilatation of the left ventricle is a fertile source of valvular disease, and chiefly of mitral disease. Dr. Goodhart's cases were, I should observe, not cases of chlorosis, but of secondary anæmia; he nevertheless very properly applies his conclusions to chlorosis and all other primary anæmias. Sir Dyce Duckworth, also, writing in 1886,² says: "Evidence is, however, accumulating to show that amongst the results of anæmia a measure of damage to the mitral and aortic valves occurs."

The chief point I have wished to make in this short paper is that bruits, indicating mitral regurgitation, occur in a considerable proportion of cases of chlorosis, and that in a small number of such cases the cardiac condition ends in permanent organic disease.

A CASE OF ELEPHANTIASIS OF THE SCROTUM.

WITH REMARKS ON ITS OPERATIVE TREATMENT.

BY CHRISTIAN FENGER, M.D.,
OF CHICAGO.

ELEPHANTIASIS of the scrotum is so rarely met with outside of the tropics that to us it has little more than a theoretical interest. At the same time our relations with the surrounding tropical countries where the disease is endemic are sufficiently intimate now, and are increasing to such an extent that it is very possible that cases of this disease may be

¹ *Lancet*, March, 1880. p. 481.

² *Brit. Med. Journ.*, July 10th, p. 57.

VISUAL DISTURBANCES DUE TO MALARIA.

SULZER (*Klin. Monatsbl. f. Augen.*, July, 1890) has made an exhaustive study of the affections causing disturbances of vision which are more or less directly referable to malarial poisoning. He divides them into two categories. The first includes the cases connected with a malarial cachexy. The second embraces those characteristic of the acute febrile attacks. In the first are: Chronic optic neuritis, leading, the bad cases, to melanosis of the papilla; diffuse infiltration of the vitreous; hæmorrhagic extravasation in the peripheral portions of the retina (these, according to Poncet, are always met with in individuals dying from malarial cachexy); sudden and incurable blindness, due, probably, to cortical hæmorrhages or embolisms. In the second category are: 1. Periodic amblyopia without any ophthalmoscopic changes. The degree of the amblyopia is variable, but in some cases may amount to complete amaurosis lasting for several days, and yet followed by complete recovery on using quinine. 2. Venous hyperæmia of the papilla and retina. 3. Large hæmorrhages in the neighborhood of the papilla and macula.

TENONITIS FOLLOWING INFLUENZA.

FUCHS (*Wien. klin. Wochenschrift*, 1890, 11) observed four cases of idiopathic tenonitis during the influenza epidemic. One reason for believing in the influenza as the direct cause of the inflammation was that three of the cases were met with within a fortnight, whilst Fuchs had only once previously come across a similar case. In two of the cases a more definite confirmation of the diagnosis was afforded by the discovery of pneumococci (Fränkel-Weichselbaum) in cultivations made from the secretion. One case went on to suppuration.

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

UNDER THE CHARGE OF

J. SOLIS-COHEN, M.D.,

OF PHILADELPHIA.

EPITHELIAL SARCOMA OF THE NASAL PASSAGES INVADING THE
FRONTAL LOBES OF THE BRAIN.

M. G. DURANTE reports (*Arch. de Lar. de Rhin.*, etc., June, 1890) an instructive case which exemplifies the necessity of caution and of precaution in attacking suspicious intra-nasal morbid growths.

A man, sixty years of age, came to Dr. Luc's clinic for what he supposed was a simple nasal polyp. The right passage was seen to be occluded by an immobile, fungous grayish mass, which bled readily. Apart from the inter-

Three short drainage-tubes, one for the penis and one for each testicle, were inserted and stitched to the border of the wound, and a dry iodoform dressing applied.

The wounds healed without suppuration, pain, or rise in temperature. After a week the drainage-tubes were removed, and in four weeks the granulating surfaces at the point of insertion of the drainage-tube and at one side of the penis, where the union between the skin and prepuce had reopened a little, were entirely healed over. As will be seen from a photograph taken six weeks after the operation (see Fig. 2), the shape of the external genitals is comparatively normal, and the following condition is now present:

The glans penis is plainly visible, protruding below the scrotum. On the left side the skin of the penis is normal; on the right, above the glans penis, there is an œdematous fold which is rapidly decreasing in size and becoming softer. The left half of the scrotum is of almost natural shape and size; the right half not so much so, but both testicles can easily be palpated in the normal position, behind the penis. The skin at the root of the penis in the pubic region is a little thicker than normal, and is still a little more voluminous than normal, but nearly approximates the natural shape. Both inguinal regions are somewhat enlarged on account of the swelling of the subjacent lymph-glands, as will be seen in Fig. 2, where the depressions due to the somewhat retracted scars over the openings from the glandular abscesses of two years ago are plainly visible.

Urination normal. As to the sexual function, I know nothing at present. His mental condition is widely different as compared with his condition prior to the operation. Instead of his former morose and non-communicative behavior, he shows now a bright and smiling countenance, and, without being invited to do so, states that his present condition is one of great happiness as compared with the period before the operation.

Microscopical examination of the structure of the tumor from the skin downward shows thickening of the epidermis and papillary layer, but the epithelial cells are of normal shape and size. There is no line of demarcation between the cutis and the subcutaneous tissue, the entire tumor consisting of a wide, semi-solid, elastic mass of tissue, which shows under the microscope the following characteristics:

Large areas of thick bundles of non-fibrillar connective tissue: the bundles in some locations running parallel to each other, and in other places interwoven and cut obliquely or transversely. Between the bundles may be seen occasional and rare connective-tissue corpuscles of normal size and shape. The vessels, arterics as well as veins, but especially veins, show an enormous thickening of the walls, the smaller veins having walls five to ten times the normal thickness. This thickening is mainly an enlargement of the external coat, the endothelium not participating at all in the thickening of the wall. In the perivascular spaces are seen here and there conglomerations of leucocytes; in other places no young cells are to be seen at all. Islands of young granulation tissue, consisting of embryonal cells densely packed together and having the same appearance as the cells in ordinary young granulation tissue, are spread all over the connective tissue. These islands differ greatly in size. I was unable to find anywhere enlarged lymph-spaces or lymphatics, but am inclined to believe that some of the

The patient was anæsthetized and the tumor held up by two assistants, and a Turner's clamp, which I had had made to secure bloodless operating, applied over the uppermost part of the pedicle, a careful examination having first been made for inguinal hernia, which showed that no such complication existed.

A grooved director was now introduced into the sinus of the prepuce leading to the glans penis, and the overlying wall of skin divided upon it until the glans penis was exposed about three inches above the peripheral opening.

Flaps of skin were now cut as follows: The anterior surface was divided into three equal parts and three semilunar flaps cut, the median being a little larger than the two lateral flaps—each lateral flap being about two inches long and two inches broad, the median flap of the same breadth but two and one-half inches long. The two lateral flaps were intended to cover the testicles, the median flap to cover the penis. A single posterior flap was then cut through the skin, about two inches long and six inches broad; that is, the whole width of the posterior surface of the neck of the tumor. The cutaneous flaps were then dissected up to the clamp. The penis was next dissected out of the tumor, leaving about one inch of preputial mucous membrane all around the glans. The skin in this region was somewhat thickened and œdematous, but reasonably movable and pliable. The left testicle was now sought for and found without much difficulty, the tunica vaginalis communis being surrounded by a looser layer of somewhat œdematous tissue, which permitted the isolation of the testicle covered with the tunica vaginalis communis, and the spermatic cord, which was then dissected up to the clamp. The right testicle was now isolated in the same way.

Both testicles and the penis, together with the three anterior flaps, were held up toward the abdomen over the upper arm of the clamp, covered with carbolized gauze, and the neck of the tumor was ablated by a series of cuts. After dividing each portion, all visible vessels were ligated, including a number of veins two to three lines in diameter.

When the ablation of the tumor had been finally completed and all visible vessels ligated, the clamp was loosened a little at one end, whereupon a number of bleeding vessels appeared, which were taken up and ligated one by one. In all, more than sixty ligatures to large and small vessels were applied. All bleeding-points in each portion cut were ligated before the next portion was divided.

The clamp was then removed, and the hemorrhage having entirely ceased, the wound was irrigated with two and a half per cent. solution of carbolic acid and the flaps united in the following way:

The two lateral flaps were united to the lateral portion of the posterior flap over each of the testicles, and the median anterior flap and the middle portion of the posterior flap made to cover the penis by stitching the lower end to the prepuce above the glans penis. The glans penis was uncovered, and although there was no tension in the covering of the body of the penis when not in a state of erection, I should in a future case like to make the median anterior flap and the middle portion of the posterior flap about an inch longer, because the skin and the prepuce were here somewhat thickened and stiff, and thus not as mobile and flexible as in the normal condition.

of which is developed an embryonal worm small enough to pass through the capillaries. This worm is periodically found in the blood of patients suffering from this disease, and is the so-called *Filaria sanguinis hominis*. It is supposed that the mature animal, as well as the ova and embryos, may cause on the one hand, by accumulation in the lymph-vessels and glands, stoppage of the lymph-current and consequent œdema in the corresponding distal territory; and on the other hand, by chemical products of their excretions, they may cause inflammation of the lymph-vessels, a plastic lymphangitis, which naturally would tend to further obstruct the lymph circulation. This may, perhaps, account for the repeated attacks of erysipelatoid inflammation in the territory of the elephantiasis.

This parasite, also, whose life history and relation to elephantiasis have been studied so carefully by Wucherer in Brazil, Lewis in Calcutta, and especially by Manson, father and son, and Myers in Amoy, and whose method of entering the human body has been studied by the last-named authors and by my friend of former years, Prospero Sansino, of Egypt, is commonly found in our Gulf States, as has been shown in an excellent paper by Mastin, of Mobile, and confirmed by Matas, of New Orleans, and others.

It is natural, then, to find elephantiasis a common, and in some places an endemic, disease in tropical countries, to which the filaria of Bancroft is geographically limited. In some localities, as for instance Samoa, the disease is so common that, according to Turner, 50 per cent. of the adult population will, sooner or later in life, have the disease. The filaria and elephantiasis have probably been imported into islands comparatively near our coast by coolies from China, as, for instance, Barbadoes, where the disease has become endemic.

But the filaria Bancrofti is not the only cause of elephantiasis, for sporadic cases of this disease in the scrotum, as well as in the lower extremities, are found in temperate and cold countries where the filaria does not exist, and are found in patients, as in the case here reported, who have never been in places where they could have been exposed to the invasion of the parasite. As would naturally be expected, the parasite is never found in these patients. Cases of this kind have been reported in England by Fergusson, in France by Velpeau, in Germany by Graefe, in Switzerland by Bircher, and also by other observers.

Clinically and anatomically there seems to be no difference between the elephantiasis of the tropics due to the filaria, and the elephantiasis in the temperate zone where no filaria is found. The changes in the lymphatic system, erysipelatoid inflammations in the lymph-spaces of the skin, and swelling of the lymph-glands, are characteristic of both classes of the disease. This swelling of the lymph-glands does not necessarily mean obliteration of the lymph-current, as stated by Kocher

islands occupied by embryonal cells, in which no bloodvessels could be seen, are lymph-vessels or lymph-spaces in a state of plastic inflammation.

Elephantiasis of the scrotum (elephantiasis Arabum) is anatomically identical with elephantiasis of other parts of the body, whether affecting the scrotum, prepuce, labia majora or the lower extremities. We find in all cases, irrespective of the etiology, an increase in all the constituent elements of the skin and subcutaneous tissue, with the exception of the hair and the glands. Thus we find thickened epidermis and inter-papillary spaces of the epithelium, enlarged papillæ and connective tissue of the cutis. The enlargement here and in the subcutaneous tissue is due to a universal formation of new connective tissue. This new formation of connective tissue in the vessel wall, chiefly in the external coat, produces the characteristic thickening of the vessels to five or ten times their normal size. It also produces a thickening of the nerves by a similar increase of interstitial tissue between the nerve bundles.

We find in the lymphatics in the later stages of elephantiasis, as in the case reported, no very characteristic dilatation. It is different in the earlier stage of elephantiasis of the scrotum, the so-called "lymph scrotum," where the tissue is still soft and cedematous. Here we find lymph-vessels and lymph-spaces dilated, sometimes to such an extent that when situated at the surface of the skin they may form thin-walled, transparent bullæ on the surface of the tumor, which may burst and empty a clear or milky lymphatic fluid, which sometimes escapes in great quantity and may cause a temporary decrease in the size of the tumor.

The condition of the lymph-glands is important. It is common to find, as in the above case, a considerable enlargement of the glands, an inflammatory enlargement, which, when due to invasion of pus microbes from an abraded surface on the scrotal tumor, may terminate in supuration.

The etiology of elephantiasis is still shrouded in mystery; this is especially true in the non-parasitic forms of the disease. Etiologically there is a great difference between the elephantiasis found in tropical countries and the variety of the disease seen in temperate and cold regions. In tropical countries the disease is uniformly ascribed to a parasite belonging to the class of nematodes, namely, the *Filaria Bancrofti*.¹ This filaria, a thin, white worm, three to four inches in length, and as thick as a human hair, is found in the lymph-vessels of the area of the elephantiasis. Here it deposits its thousands of eggs, out of each

¹ B. Scheube: "Die Filaria-krankheit." Volkmann's Sammlung klin. Vorträge, 1883, No. 232.

The *prognosis* is good, and it is only in exceptional cases that danger arises from septic inflammation on the surface of the tumor, with gangrenous destruction of a portion of the inflamed area and resultant general sepsis.

Treatment.—Elevation of the tumor, compression, warm, moist applications, local mercurial inunctions, in connection with the internal use of the iodides, iron, chlorate of potassium, and bichloride of mercury, have proved successful in exceptional cases only, and then in the earlier stages alone.

Non-radical treatment is, of course, of far more importance in elephantiasis of the lower extremities, where amputation should be deferred as long as possible, than in elephantiasis of the scrotum, where early operation is so much the more admissible, as no mutilation of the genital organs is caused by it.

The dangers of the operation in elephantiasis of the scrotum are hemorrhage and sepsis. For this reason, in former times, partial excisions and operations with the *écraseur* or galvano-cautery were resorted to, but these procedures have now become entirely obsolete.

The prognosis of the operation, which in pre-antiseptic times was comparatively grave, has gradually lost its dangers. Thus we see, from Kocher's statistics, an early mortality of twenty-seven per cent. in sixty-one cases reported by Fayrer; of nine and one-half per cent. in twenty-one cases reported by Ballingall; of five per cent. in one hundred and sixty-one cases reported by Esdaile; of three and three-tenths per cent. in sixty-one cases reported by Manson; and more recently one and one-half per cent. in one hundred and thirty-eight cases reported by Turner. The better prognosis of the operation in Turner's cases is due to asepsis as well as to the great improvement in the technique of the operation. Therefore, in the case above reported I adhered strictly to the method of operating as laid down by Turner. *Hæmostasis* is made absolute by the use of Turner's clamp, which has been already mentioned.

Perfect covering of the penis and testicles is secured by the flaps as devised by Turner and described in my operation, thereby avoiding sepsis from non-union of a large wound surface, as in the older operations, in which for fear of hemorrhage the tumor was cut off transversely, or in which sometimes the penis and testicles were removed with the tumor and the large wound surface left to heal by granulation.

The bloodless operation, by means of the clamp or elastic constriction, gives the operator time to carefully dissect out the penis, testicles, and spermatic cord, and to open and radically operate upon hydrocele, if present. The clamp is preferable to an elastic constrictor, because the latter is, as stated by Kocher, very liable to slip off during the separation of the tumor, while the clamp can be gradually loosened one end at a time, admitting ligation of the smaller vessels step by step. This

in his excellent monograph on diseases of the male genital organs,¹ for in a case of elephantiasis published by Bryk, the enlarged lymph-glands were permeable and the lymph-vessels dilated, even as far as the thoracic duct. Swelling of the lymph-glands, according to Kocher, often precedes the development of elephantiasis, and is supposed to play an important part in the etiology of the disease, both within and outside of the tropics. But it is entirely unknown why so common an affection as enlargement of the lymph-glands should result in elephantiasis in such exceedingly exceptional instances as we find to be the case.

Symptoms.—Elephantiasis of the scrotum is usually of a softer consistence than when the disease exists in the legs, but the swelling increases more rapidly. Soft and œdematous at first, the so-called lymph-scrotum, it gradually becomes harder. The unequal thickening of the epidermis causes the surface, which was originally smooth, to become nodular and irregularly corrugated. The increase is not uniform, but intermittent, following the repeated inflammatory attacks. These attacks are characterized by redness and swelling, but are attended by very little pain, the skin over the tumor being to a greater or less extent anæsthetic. Atrophy of the sebaceous glands and hair-bulbs is followed by falling out of the hair. Here and there scales of thickened epidermis and crusts of dried secretion from abraded surfaces or from ruptured dilated lymph-vessels cover smaller or larger areas over the tumor.

By the increase in the size of the tumor the testicles are buried, so that after a while their location cannot be detected except when hydrocele coexists. The increase in size of the prepuce, together with the increase in the skin of the scrotum, makes the penis disappear, the skin being drawn downward and forward in front of the glans, forming a sinus sometimes several inches long leading up to the urethra, surrounded by a separate tumor like a smaller appendix on the anterior surface of the large tumor. A deep furrow is usually seen on the end or on one of the sides of the transformed prepuce, which forms the entrance to the urinary sinus through which the urine dribbles down during micturition over the tumor, which probably helps in the causation of the maceration of the epidermis and the surface inflammation.

As the elephantiasis is on the whole painless, the chief inconvenience to the patient is caused by its weight. Tumors of thirty to fifty pounds in weight are commonly seen, and a tumor weighing one hundred pounds has exceptionally been observed. This, however, does not influence the general health of the patient, who is, as a rule, as in the case cited above, able to do manual labor, notwithstanding the presence of the large tumor.

¹ Theodor Kocher: "Die Krankheiten der männlichen Geschlechtsorgane." Deutsche Chirurgie, von Billroth und Luecke, 1887.

manner presented in this paper. The results reached appear to be of importance in confirming Neumann's statements regarding the physiology of muscular response to electrical stimulation; in presenting a series of facts regarding the effect of the application of alternating currents to muscles, not as yet investigated; in determining the possibility of reaching prognostic facts of great value in doubtful cases by electrical tests with the alternating current; and, finally, in demonstrating the effect of strychnine and arsenic on the nervous functions.

Erb says (Ziemssen's *Cyclopædia*, Amer. edit., vol. xi. p. 433), "the extraordinary fact that in the reaction of degeneration the muscle fails for a long time to react to the stimulus of the faradic current while it readily responds to the galvanic stimulus has been explained by Neumann in the following satisfactory manner: 'Muscles,' he says, 'that have undergone this pathological change have simply lost the power of responding to currents of momentarily short duration, while they react in an increased and qualitatively altered manner to currents of longer duration. But inasmuch as faradic currents are, without exception, currents of only momentary duration, the muscles do not react to them. . . . The value of the change by which the muscular tissue loses its normal power of reacting to currents of short duration is a question the solution of which must be left to physiologists.'"

Mr. Young has shown that the length of duration of stimulus required to cause contraction in a paralyzed muscle varies in accordance with the degree of progress toward recovery; varies also in accordance with the subjective feeling of strength; varies also in dependence upon the use of strychnine in interrupted or continuous dosage.

The practical result of his investigation is to enable a physician by careful measurement to construct a prognostic curve which will enable him to give certain hope of recovery to a patient completely paralyzed, or will establish the unfortunate fact of a permanent loss of power. It also makes it evident that in using arsenic or strychnine as a stimulus to the spinal cord it is better to give the drug for short periods with intermissions than continuously.

The accuracy and care of the investigation and the importance of the conclusions arrived at should attract the attention of physiologists, and especially of neurologists, to this contribution to medical science.

II.

By MR. YOUNG.

Certain nervous diseases are followed by a loss of voluntary contraction in the muscles, and in such muscles we sometimes notice electrical reactions which present a marked contrast to those of muscles in their normal condition.

makes the operation with the clamp, notwithstanding the numerous and very large vessels, almost entirely bloodless.

The removal of the penis and testicles can in all probability be always avoided by Turner's operation, and should at least be always attempted, although Esdaile regards it as dangerous not to remove these organs in tumors which weigh more than fifty pounds. In two cases reported by Lloyd, tumors of sixty-five and sixty-one pounds in weight, respectively, were successfully removed with preservation of the penis and testicles. In these operations soft twisted ropes were used as constrictors and the flaps made according to the method of Turner.

The preservation of the penis and testicles is the more important because the genital functions remain undisturbed in the case of patients suffering from elephantiasis.

RESPONSES TO THE ALTERNATING GALVANIC CURRENT IN NORMAL AND DEGENERATE MUSCLES.

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AND

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I.

By DR. STARR.

THE following article presents in a concise form the results of a scientific investigation upon the effects of an alternating galvanic current of electricity upon normal and degenerate muscles. The research has been made by one who is thoroughly conversant with all recent advances in the knowledge of electricity and of all its mechanical appliances, and who has had exceptional facilities at Princeton for the prosecution of careful experiments by the aid of the best apparatus. Mr. Young is a practical electrician, who has been for three years recovering from a condition of acute anterior poliomyelitis of considerable extent, produced by the passage of an alternating current through his entire spinal cord. His treatment has been partly mechanical, various devices for exercising paralyzed muscles having been made and used by him with success; partly electrical, the muscles being daily stimulated by alternating currents of moderate strength in the manner described by him; partly medicinal, by arsenic and strychnine, with results whose effects have been objectively proven by electrical tests in the

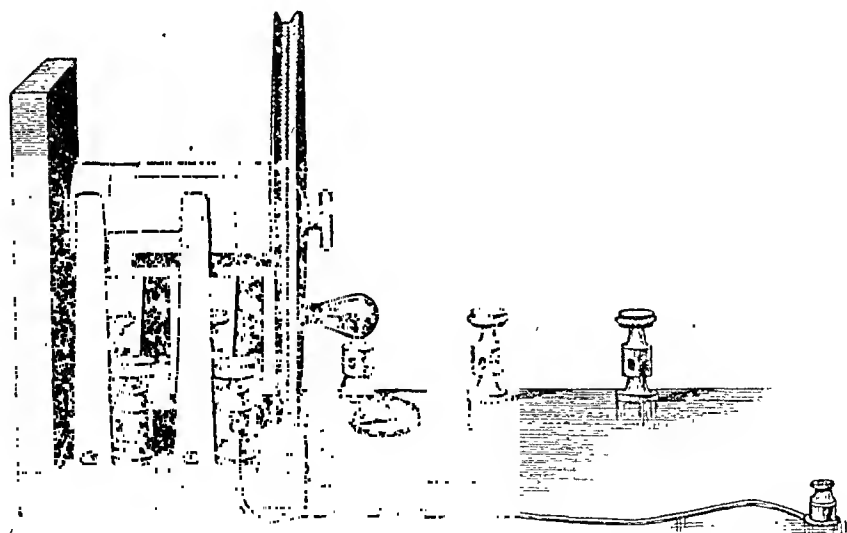
voltaic alternatives, in conditions known as the reaction of degeneration, is not to be ascribed to any difference in the nature of the current, but only to the fact that the degenerated muscle will not respond to changes of state so rapidly produced."

There must be a certain amount of lag in the response of any muscle to an applied electro-motive force, though in the case of a healthy muscle it must be very small, and probably would have to be measured in thousandths of a second, if not in some smaller unit. But in a degenerated muscle it would appear that this lag amounts to something appreciable. If, by means of a suitable commutating device, we apply voltaic alternatives to such a muscle, and have some means of measuring the rate of alternation at which the muscle ceases to respond to a given current, we can ascertain the lag of that muscle's response behind the applied electro-motive force.

It has occurred to the writer that this test might possibly give some knowledge of the condition of a degenerated muscle, and with this end in view the following apparatus was assembled:

First, a rotary commutator (Figs. 1 and 2) to give voltaic alternatives. For every revolution of this commutator the current is reversed six

FIG. 1.



Commutator.

times. The pulley wheel of the commutator is four inches in diameter and is driven from a half-inch pulley on a small electric motor (Fig. 3) Current is supplied to the motor from a storage battery; and by means of a variable resistance the motor can be made to run at any speed from about 500 to over 6000 revolutions per minute.

A normally healthy muscle responds to the rapidly interrupted current from the faradic coils, and the muscle remains permanently contracted as long as the current is applied.

On applying the perfectly steady current of a galvanic battery we find the following effects: With the negative electrode on the muscle, and the positive anywhere on the body remote from the muscle, we get a contraction at the moment the circuit is completed; but this contraction, unlike that produced by faradism, is not tetanic. If we now interchange the electrodes we find that the muscle responds also to the positive pole of the battery, but not so strongly as to the negative. We again notice that, during the interval between making and breaking the circuit, the muscle tends to return to a state of rest.

On applying the above tests to a degenerated muscle we find, first, no response whatever to the faradic current. In the second place we find the responses to a galvanic current appearing in reverse order; viz., while a healthy muscle responds more vigorously to the negative than to the positive electrode, on completing the circuit, the degenerated muscle responds more vigorously to the positive; and these reactions, in the case of a degenerated muscle, are again reversed on breaking the circuit.

If we now examine a muscle which is regaining its power after being paralyzed, we may find the response to the positive pole of a galvanic battery the stronger; the responses to positive and negative may be equal; or that to the negative may be the stronger, as in the case of a normally healthy muscle. On applying the faradic current we may find no response, a response to but one of the electrodes, or a response to both, according to the condition of the muscle and the strength of the current applied.

It is well known that the faradic coil does not give a true alternating current. The current is strong in one direction and weak in the other, so that one electrode is a strong positive and weak negative, while the other is a strong negative and weak positive.

The writer, who has been able to supply the muscles for testing in his own person, has at different times found all the responses referred to above. Where a muscle has responded to but one electrode of the faradic coil it has invariably been to the strongly positive; but in such a case it has sometimes been possible to obtain a response to the strongly negative by increasing the strength of the current. As might be supposed, that muscle has shown a stronger response to the positive pole of a galvanic battery than to the negative.

Dr. Starr, in his article on "Therapeutic Uses of Electricity,"¹ says: "The difference of response to the faradic current from that of

¹ The Medical News, March 30, 1889.

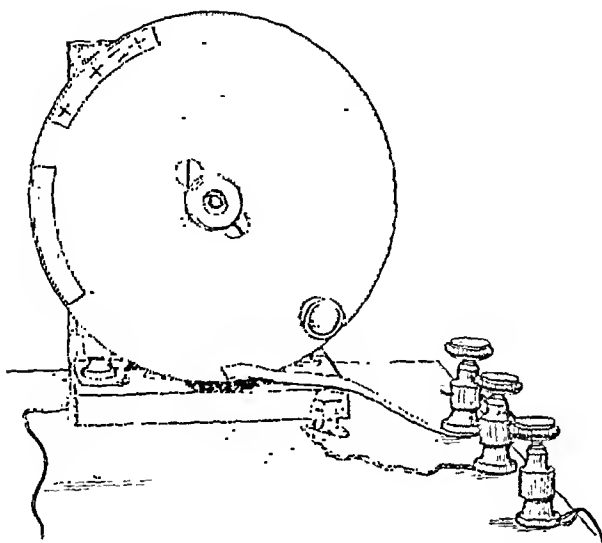
ference with respiration, and slight debility in consequence of recurrent epistaxes, a tendency to cephalalgia and some tendency to being dazzled, the patient had appeared perfectly well, expressed himself freely, and presented no indication of intellectual trouble.

Recognizing a malignant tumor inoperable without external access, Dr. Luc sent the patient to the *Hôpital Laënnec*, where, in the view of the absence of cerebral symptoms, it was proposed to operate the next day. As the patient arose in the morning, he tottered over and fell dead. The autopsy, twenty-four hours later, revealed at the base of the cranium a grayish, puriform, and malodorous grumous mass covering the entire space comprised between the anterior portion of the cribriform plate of the ethmoid bone and the wings of the sphenoid. The cribriform plate was perforated and destroyed on both sides; and so was the body of the sphenoid, the destruction being more complete on the right side than on the left. The bones were represented by a semi-liquid puriform clot, through which the canulated sound penetrated into a vast anfractuous cavity formed of the nasal fossæ and the ethmoidal, sphenoidal, and maxillary sinuses largely opened by destruction of their walls. From this orifice a portion of the tumor was removed as an irregularly-lobulated grayish neoplasm, almost completely softened and diffuent in some places, and of fleshy consistence in others, but readily reduced to grumous masses by digital pressure. The dura mater and pia mater of the anterior region of the base of the brain were destroyed. All that portion of the base of the brain comprising the inferior face of the two frontal lobes, the anterior perforated spaces, and the chiasm of the optic nerves, was bathed in this same puriform matter, and showed, after being washed with a jet of water, that it was invaded by the neoplasm. The right olfactory nerve was completely destroyed, and but a number of shreds of the left remained, imbedded in pus and false membranes. The chiasm also was covered and invaded by the false membranes, and softened to such an extent as to make it difficult to understand how sight had been preserved. The inferior portion of the first frontal convolution, the beak of the corpus callosum, and the gray layer of the optic nerves had disappeared; and in their stead was a cavity, the dimensions of a small egg, occupying the two frontal lobes. This cavity was filled with a gray-brownish, grumous, purulent liquid, of an infectious odor. The walls were covered with a corrugated grayish membrane with fine green punctations. The cavity was entirely within the frontal lobes, and was separated from the convexity by a thickness of cortical substance, varying from one centimetre to one centimetre and a half. Behind and below it was separated from the lateral ventricles by a very thin layer of nerve substance which broke through on opening the brain. The ventricles contained but a few drops of liquid, and their walls absolutely healthy, were not even injected. The optic layer and the striated bodies were healthy, and in fact there were no other morbid conditions in the brain.

The tumor, on microscopic examination a sarco-epithelioma, had destroyed the superior walls of the nasal cavities, and had progressively invaded the frontal lobes, where it had produced an abscess, possibly in consequence of the secondary penetration of septic elements, but more probably in consequence of softening and disintegration of its central portions.

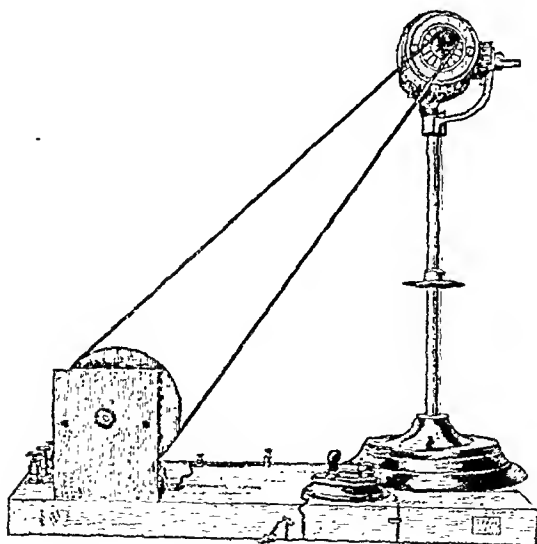
The speed of the commutator is recorded automatically on a chronograph, which may be thrown in and out of circuit at pleasure by a switch placed within easy reach (see Fig. 3, near the base of the motor).

FIG. 2.



Commutator, with arrangement for completing chronograph circuit at every revolution of wheel.

FIG. 3.



Commutator and motor.

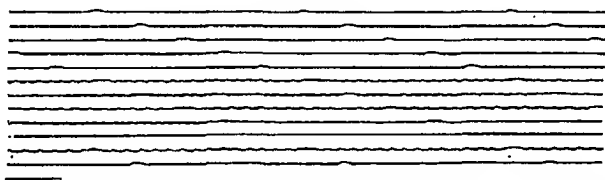
The chronograph (which is near at hand in the astronomical observatory of Princeton) records every other second from a standard clock.

The recording of the commutator revolutions is effected in the following manner:

On referring to Fig. 2 there will be seen, at the base of the commutator, a projecting tongue of brass, so placed that at every revolution a little knob on the commutator wheel strikes it and depresses it, causing it to come in contact with the head of a screw placed beneath. This, when the switch (referred to above in Fig. 3) is closed, completes the chronograph circuit, so that each revolution of the commutator wheel is recorded.

Fig. 4 shows the appearance of a record made by the chronograph. The first five lines show the clock record alone. In the lines below each

FIG. 4.



Fragment of chronograph sheet showing clock record, together with records made by commutator when run at different speeds.

little tooth stands for one revolution of the commutator. Now, as there are six reversals of the current for every revolution of the commutator, it is a simple thing to compute the number of reversals per second from the chronograph record.

The current which we apply to the muscle in our test is supplied by a battery of Leclanché cells giving about 40 volts, is regulated by a liquid resistance which we can vary at pleasure from about 30,000 ohms to less than 1 ohm, and is measured by a milliampère-meter. In connection with the milliampère-meter is a switch to cut it out of circuit when the commutator is turning. It may be well to mention the fact that the resistance of the milliampère-meter is so small compared with the total resistance of the circuit that our cutting it out changes the value of the current by only an inappreciable amount.

In the following tests the electrode placed on the muscle we wished to examine was circular in shape and about three-fourths of an inch in diameter.

Test on biceps of right arm. This muscle has lost all power of voluntary contraction. In it we find the usual phenomena which accompany degeneration, viz., no response to faradism, and with the galvanic current a stronger response to the positive than to the negative pole. We apply the small electrode to the muscle at the motor point, the other electrode, a sponge, being placed on the left arm near the shoulder. On adjusting the variable resistance to give a current of about ten

milliampères through the muscle, and setting the commutator in motion, we find the effect of the voltaic alternatives is as follows:

(a) We start at a low rate of speed and find the muscle responds separately to each reversal of the current.

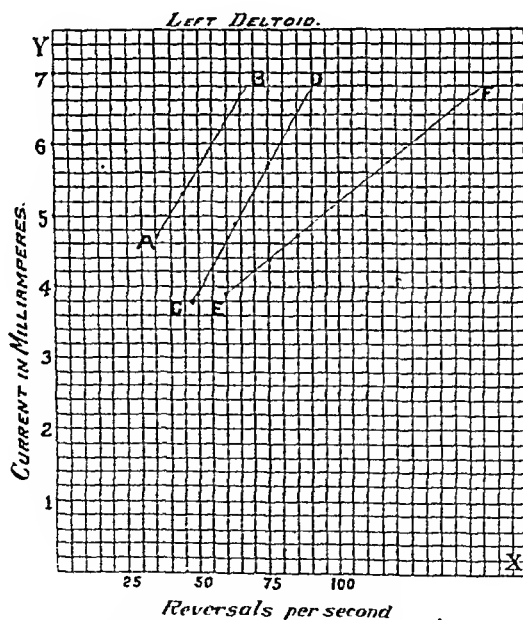
(b) At a higher rate of speed the muscle becomes permanently contracted and begins to lift the forearm, and the arm is held up as we increase the speed up to a certain point.

(c) We still increase the speed, little by little, and we now observe the muscle gradually relax; the arm sinks down; and at last we attain such a speed that, on breaking and making the circuit by means of a suitable key, we find the muscle refuses to make the slightest response to the current alternating at such a rate.

To show that the sinking down of the arm, observed at *c*, was not due to fatigue of the muscle, we have the circuit closed, and gradually reduce the speed of the commutator. The muscle begins to contract as the rate of alternation grows less; the forearm is again lifted and held up for a while; the muscle begins to relax, and the arm gradually sinks down again; and, at the end, the muscle contracts separately for each reversal of the current. In short, the phenomena *a*, *b* and *c* appear again, but in reverse order.

On making the above test with currents of different strength, we find that the rate of alternation at which the muscle ceases to respond varies

FIG. 5.



A B, from test made October 22d.

C D, " " December 25th.

E F, " " February 25th.

with the strength of the current used. This being so, by making three or more tests on a muscle for disappearance of contraction, with dif-

ferent strengths of current, we can plot the whole result on cross-section paper, and draw a line which may, perhaps, tell us something about the condition of the muscle at the time the test was made. Fig. 5 shows three such lines drawn from tests made respectively October 22d, December 25, 1890, and February 25, 1891, on the left deltoid. The condition of that muscle was practically the same as that of the biceps of right arm. As will be seen, the current, in milliamperes, is plotted on the axis of Y, and the rate of alternation (reversals of current per second) on the axis of X. The lines A B, C D, and E F, represent respectively the October 22d, December 25th, and February 25th tests, and demonstrate an increasing power of response in this muscle to the alternating current.

Let us, for brevity, call the rate of alternation at which the muscle ceases to respond to a given current, the *critical rate* for that current. On referring to Fig. 5 it will be seen that, in the line A B, the critical rate for a current of 5 milliamperes is about 41; in C D, for the same current, it is about 64; and in E F about 93. Of course the critical rates for any other current can also be compared by a glance at the three lines given in the figure.

In a series of tests made on the right and left deltoids, and covering a period of about five months, the changes in the critical rates have been anything but uniform, and the two muscles have not always varied alike. But the writer has noticed that on days when he felt energetic and "full of snap," so to speak, the critical rates were generally higher than those of the preceding tests; and on days when there was a feeling of lassitude the critical rates were generally no higher than those of previous tests, and they were often lower.

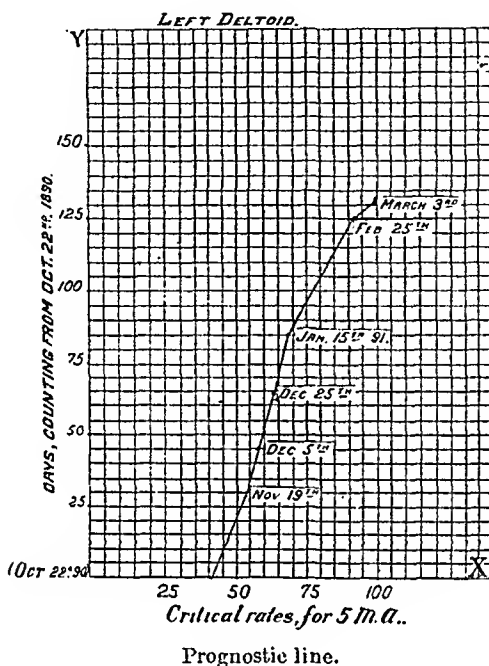
Now, to combine a series of tests in a single line, suppose, for example, we measure off time, in days, on the axis of Y, and the critical rates for some given current on the axis of X. The line we get may be called a graphic representation of changes in the condition of the muscle tested, with respect to electrical reaction, during the interval between the first and last test. If the line incline to the right there has been a gain; if it be vertical, no gain; and if it incline to the left it indicates a loss. In Fig. 6 we have drawn such a line from tests made on the left deltoid. The line demonstrates the progress toward recovery in that muscle.

After the experience gained in following up a large number of muscles by the critical rate test, it seems evident that it might be possible to draw what could be called, in general, a prognostic line of a given muscle, after a certain number of tests had been made on that muscle at stated intervals.

While the tests given here are merely tentative, and have been made without any former experience to guide us, they seem to make it obvious

that, given a degenerated muscle which will not respond to faradism, but will respond to a current alternating at a much slower rate, we can ascertain the rate of alternation at which the muscle first ceases to respond to a given current, by beginning at a slow rate and gradually

FIG. 6.



increasing. It is also clear that this rate varies with the strength of current applied, being higher for a stronger current and lower for a weaker; and the fact that the different points in each test in Fig. 5 lie so nearly in the same straight line makes it look as if this rate varied *directly* with the strength of current, at least within the limits of these tests.

We, moreover, think we are justified in assuming that if, with a given current, a healthy muscle will respond to a rate of alternation which will not affect a degenerated one, an increase in the rate to which the degenerated muscle will respond shows increased susceptibility in that muscle, and a tendency to approach, in some way, the condition of a healthy one.

We have noticed incidentally a coincidence between a change in the electrical response and the use of medicine (acid. arsen. $\frac{1}{30}$, strych. $\frac{1}{50}$, t. i. d.). It has seemed that we got a better response of the muscles from about the third day after beginning the medicine and that this improvement continued about a week; after which time the response

seemed to be less vigorous. This can be seen by a study of the following table. This also shows that the cessation of the medicine after it had been taken for a month continuously was followed by an increase in the response. It seemed, therefore, that better results were secured by taking the medicine for ten days and intermitting for ten days than by taking it continuously.

Responses of the Left Deltoid Muscle.

	Critical rates.		
	With 3.8 milliampères.	With 4.7 milliampères	
October 22,	22	36	No medicine.
November 13,	38	48	Medicine from November 5th to
“ 19,	47	58	December 3d.
December 5,	36	58	Medicine stopped.
“ 10,	45	58	
“ 17,	38	52	
“ 25,	48	62	
January 2,	53	62	
“ 8,	33	47	Medicine from January 6th to
“ 15,	60	76	February 2d.
“ 26,	47	51	
February 2,	57	78	
“ 9,	53	69	Medicine stopped.
“ 19,	62	95	
“ 23,	53	80	
“ 25,	54	84	Medicine from February 24th to
March 3,	63	95	March 10th.
“ 10,	52	83	Medicine stopped.
“ 16,	60	87	
“ 18,	54	77	

The writer, making no claim to medical knowledge, feels some diffidence in approaching the medical profession with an article upon a subject which lies within their peculiar province. But having good reason to be interested in the subject of degenerated muscles, and being also more or less familiar with the handling of electrical apparatus, and having the chronograph and most of the other appliances at hand, he undertook to test his own muscles by this method. The results obtained seemed so interesting that, at the suggestion of Dr. Starr, the method is here given.

THE POSSIBLE RESULTS OF CÆSAREAN DELIVERY,
 AS SHOWN BY THE MARVELLOUS RECORD OF LEIPZIG, GERMANY, FOR
 THE YEARS 1880 TO 1891, UNDER SEVEN OPERATORS, AND AS
 THE RESULT OF IMPROVED METHODS, TIMELY
 RESORTED TO.

BY ROBERT P. HARRIS, A.M., M.D.,
 OF PHILADELPHIA.

No one living writer has done so much to disseminate a knowledge of the past in puerperal cœlio-hysterotomy in all countries and to reduce the mortality of the operation itself by improved methods as Dr. Max Sänger, of Leipzig, who, upon August 20, 1880, inaugurated with success, in a very unfavorable case, the "New Cæsarean operation," as it is usually performed to-day. It is not generally known that he was led to prepare his monograph, *Der Kaiserschnitt bei Uterusfibromen nebst vergleichender Methodik der Sectio Cæsarea und der Porro-operation*, in 1881, because of an experience with a then novel plan of treating the uterine wound, by which he became one of seven operators out of forty-one who each saved a case in a list of forty-three, where the Cæsarean operation became a necessity because of an obstruction due to a uterine fibroid. This valuable paper of two hundred pages is a mine of wealth to anyone who wishes to compare the present with the past of Cæsarean surgery, and no one can better appreciate the labor bestowed upon it than the writer of this present paper, who has himself had some experience in the same line of arduous research. In this monograph Dr. Sänger devotes over ten pages to a full report of his first Cæsarean case, from which we learn that he introduced six strong carbolized silk sutures at equal distances nearly through the uterine walls and then intermediately four superficial ones, taking in a portion of muscular tissue, the serous coat being applied to serous coat all along the wound ("Serosa lag überall an Serosa"); these being tied, there was no gaping between them and no escape of blood.

Fearing that this mode of closure might not be sufficient in all cases to prevent the escape of fluid from the uterus, Dr. Sänger proposed to use a much larger number of stitches, to exsect a portion of the muscular edges of the wound, and to welt in the peritoneal coat in tying the superficial sutures. This plan, proving a great success in the hands of Leopold and others, was given, out of compliment to its proposer, the name of the "Sänger operation." In time it became evident that the resection of the muscularis and the dissecting up and welting in of the peritoneum were not absolutely essential to success, and the operation was simplified by leaving them out—first the resection, and then, in ordinary cases,

the wetting in. These changes, in the view of many, eliminated from obstetric surgery the Säger operation; but has it changed his title to his original method of treating the uterine wound? We are not partial to calling operations by the names of their originators, but are satisfied that there is still a *Cæsarean operation after the method of Säger*. We may call all the operations "new Cæsarean" in which asepsis, multiple suturing in two rows, with careful adjustment of the serosa, and the use of carbolized silk, silver wire, or chromic catgut, is employed. But who did the most to bring these steps into use and to make known their value to the world? Everyone is supposed to know what the "old Cæsarean operation" was, and what a frightful mortality it had, except where it happened to have been performed early and upon healthy women. Suturing the uterine wound was a grand step—but how timid men were in doing it! One stitch, sometimes two or three, and very rarely five. They were apparently more afraid of doing it than leaving a gaping wound as an exit for poisoning fluid to escape through into the peritoneal cavity. It will be of interest to examine our American suture record down to August 20, 1880, and see what material was used, how many stitches were taken, and how the case terminated:

Here we have an array of cases, some of which might be placed in contrast with that of Dr. Säger of the year 1880. The first to use as many as ten uterine sutures was Dr. T. A. Foster, of Portland, Maine, on May 23, 1870; but these stitches were all deep and their ends were brought out of the abdominal wound. Then we have the operation of Dr. R. O. Engram, of Montezuma, Georgia, following a craniotomy, on September 18, 1874, but not reported until October, 1885. In this case carbolized silk sutures to the number of ten were used in the uterine wound, of which three were deep, three semi-deep, and four peritoneal. This operation saved the woman, but lost its value to the profession in the fact that the process was not reported until there had been twenty-six operations founded upon the example of Säger, with sixteen women and twenty children saved. A claim to precedence now made would amount to very little in view of the advances gained under the teachings of Leipzig and Dresden. And then we have a third case, which has been really heralded as a prior claim, in which after a labor of seven hours a woman and child were saved, on May 8, 1875, under a disciple of Hahnemann, in Toledo, Ohio, five deep sutures of silver wire being used and "care being taken to approximate the peritoneal edges."¹ This word "edges" was subsequently altered to "surfaces," with a pen; but we take the original text as we have it, which is the old surgical

¹ Silver-wire Sutures in the Cæsarean Section. By S. S. Lungren, M.D., Toledo, Ohio, 1876. Pamphlet, 13 pages.

direction of "edge to edge" in the closure of incised wounds.¹ But with only five sutures in a five-inch wound we should have little control over gaping and leakage in a Cæsarean operation following a long or exhausting labor.

Year.	Time in labor.	Material used.	Number of sutures.	Cause of death in woman.	Time of survival in woman.	Result to woman.	Result to child.
1828	15 months at intervals.	Silk.	2 or 3	Peritonitis.	To second week.	Died	Dead.
1851	4 days.	"	?	Exhaustion.	24 hours.	"	"
1852	40 hours.	Silver.	?	R.	.....	Recovered.	"
1867	62½ hours.	Hemp.	3	R.	.....	"	Living in 1883.
1867	10 days.	Silver.	6	.....	.....	"	Dead.
1870	44 hours.	"	1	.....	42 hours.	Died.	Living.
1870	2 weeks.	Silk.	10 with the ends left out.	.....	60 "	"	Living; died in a few days.
1871	3 days.	Silver.	2	Peritonitis.	72 "	"	Dead.
1872	Long.	Silk.	1	Hemorrhage and exhaustion.	Short time after operation	"	"
1874 ²	.....	Carb. silk.	3 deep, 3, ½ deep, 4 peritoneal	R.	.....	Recovered.	"
1875	7 hours.	Silver.	5	R.	.....	"	Living in 1889.
1875	38 hours. Membranes entire.	Silk.	1	R.	.....	"	Living.
1875	6 hours. In bad health.	"	5	Exhaustion, 15 yrs. old.	2 days.	Died.	Lived 13 days.
1876	Early.	Silver.	3	Peritonitis.	5 "	"	Dead
1877	Almost died of exhaustion in operation.	"	1	Exhaustion.	15 "	"	Lived 2 days.
1877	7 days.	"	4	R.	.....	Recovered.	Dead.
1878	Not in labor.	Silk.	7	R.	.....	"	"
1878	24 hours.	Carb. catgut	7	Heart-clot.	7 days.	Died.	"
1879	2½ days.	Silk.	3	Probably hemorrhage	36-40 hours	"	Moribund.
1879	30 hours.	?	1	Septicæmia.	33½ "	"	Dead.
1880	3 hours.	Horsehair, silk.	9 horsehair 3 silk.	R	.....	Recovered.	Living in 1889.
1880	30 hours.	Silver.	2	R.	.....	"	Dead.
		Silk, 11 Recov. 5 Silver. 9 Recov. 5	Average, 4.25	.....	.....	Recov. 10 Died 12	Dead 13 Lived 6 Soon died 3

From ten silk sutures used by Säger in 1880, the number gradually grew to a maximum of sixteen deep and thirty-five superficial, under Döderlein, of Leipzig, in 1887, since which time a desire to simplify has largely decreased the number without any apparent increase of risk, until Murdoch Cameron, of Glasgow, has saved nine women out of ten by the use of seven to twelve deep sutures and superficial intermediates as may be required. And Dr. Kelly, of Baltimore, saved his fourth patient, on January 16, 1891, by the use of seven deep and eight semi-deep silk sutures, going back almost to the number used in Säger's

¹ Archives de Tocologie, Paris, Jan. 1877: "En ayant soin d'affronter les bords péritonéaux."

² Reported in 1885.

first case, and using them as he did. We may call this method the "new Cæsarean," the "improved Cæsarean," or, if the sexual power of the woman remains intact, the "conservative Cæsarean" operation; but it is Säger's method in its original form notwithstanding, and antedates the first improvement by him under Leopold by twenty-one months. It will, no doubt, surprise many to learn that Prof. Säger still has a claim to the "improved Cæsarean operation," although his main additions to the technique have disappeared from general use.

We now present the very remarkable Cæsarean record of the city of Leipzig, as furnished, under a request, by Prof. Max Säger:

No.	Date.	Operator.	Hospital or private.	Age	Number of pregnancy.	Cause of difficulty.	C. V.	Result to woman.	Result to child.
1	Aug. 20, 1880	Dr. Säger,	Private	30	2d	Retro-uterine fibroid.	...	Recovered	Dead a month.
2	May 25, 1882	" Leopold,	Private clinic.	29	2d	Contracted pelvis.	6 cm.	"	Living.
3	Nov. 16, 1884	" Säger,	University clinic.	21	1st	" "	6-6.5	"	"
4	July 3, 1885	" "	" "	32	4th	" "	...	"	"
5	Aug. 2, "	" Obermann	" "	42	1st	relative indication. Contracted pelvis.	...	"	"
6	Oct. 20, "	" Säger,	" "	38	4th	" "	...	"	"
7	Dec. 9, "	" "	" "	35	4th	" "	...	"	"
8	Nov. 13, 1886	" Donat,	" "	34	4th	" "	...	"	"
9	Nov. 18, "	" Weber,	" "	36	5th	" "	...	"	"
10	Apr. 12, 1887	" "	" "	33	4th	" "	7.5	Died of sept peritonitis.	"
11	May 1, "	Prof. Zweifel,	" "	41	5th	" "	6.5	Recovered	"
12	May 3, "	" "	" "	32	7th	" "	7-7.5	"	"
13	June 22, "	" "	" "	30	7th	" "	7.5	"	"
14	Aug. 22, "	Dr. Döderlein,	" "	31	2d	" "	8	"	"
15	Sep. 23, "	" Obermann	" "	28	4th	" "	7.5	"	"
16	Dec. 17, "	" Säger,	Private clinic.	30	5th	" "	6	"	"
17	Feb. 8, 1888	Prof. Zweifel,	University clinic.	21	1st	" "	6	"	"
18	Nov. 2, "	" "	" "	25	.....	" "	7	"	"
19	Dec. 17, "	" "	" "	31	8th	" "	7-7.5	"	"
20	Dec. 29, "	" "	" "	26	.....	" "	6.6	"	"
21	Jan. 13, 1889	" "	" "	25	.....	" "	9.5	"	"
22	Jan. 20, "	" "	" "	23	.....	" "	7.6	"	"
23	Feb. 12, "	" "	" "	26	.....	" "	7.5	"	"
24	July 2, "	" Säger,	" "	29	.....	" "	7.5	"	"
25	Dec. 21, "	Dr. Säger,	Private clinic.	36	1st	Contracted pelvis and rupture of lower uterine segment.	8-8.5	"	"
26	Oct. 14, "	Prof. Zweifel,	University clinic.	41	.....	Osteomalacia.	5	"	Dead.
27	Dec. 31, "	" "	" "	34	8th	Second Cæsarean of Case 12.	7-7.6	"	Living.
28	June 2, 1890	" "	" "	28	1st	Contracted pelvis and eclampsia.	7	Died of uremia.	"
29	July 9, "	" "	" "	30	1st	Contracted pelvis.	...	Recovered	"
30	Aug 14, "	Dr. Hertzsch,	" "	37	3d	" "	...	"	"
31	Sep. 14, "	Prof. Zweifel,	" "	23	2d	" "	8	"	"
32	Nov. 17, "	" "	" "	36	2d	" "	8.5	"	"
33	Nov. 30, "	Dr. Döderlein,	" "	32	3d	" "	7.75	"	"
34	Dec. 9, "	Prof Zweifel,	" "	27	1st	" "	8.5	"	"
35	Apr. 16, 1891	Dr. Säger,	Private clinic.	21	1st	" "	6.5	"	"

Prof. Paul Zweifel now stands at the head of the Cæsarean operators of the world, having lost but one woman and one child in eighteen cases. He is a rapid operator, still uses a large number of sutures, and is par-

Clinically, the observation is curious in view of the latence of cerebral symptoms, which were not suggestive of any invasion of the encephalon. It shows, too, once more, the prudence requisite in undertaking extirpation of nasal growths, for there was no serious contra-indication in this instance, and yet, in all probability, sudden death would have ensued during an operation.

It is interesting, too, as a fresh example of the tolerance of the brain, and particularly of the frontal lobes, to lesions which should apparently have determined death, or at least grave nervous symptoms long before they had reached the extent they had undergone.

In concluding, the remark is made that, as both frontal lobes were equally affected, there could be no assumption that the unknown functions of one side had been here supplemented by an intact homologous region of the other side.

A NEW METHOD OF NASAL IRRIGATION.

PINS, of Vienna (*Mercure Médical*, April 20, 1890; *Rev. de Lar.*, etc., August 15, 1890) uses a small Wolfe bottle, to the longer tube of which a mouthpiece is attached by rubber tubing, while a nozzle is similarly attached to the short tube. The patient blows the liquid into one of his nasal passages, and, as the forced expiration occludes the rhinopharynx, the liquid escapes by the other nostril.

POSTERIOR HYPERTROPHIES OF THE TURBINATES.

DR. HARRISON ALLEN, of Philadelphia, in an excellent clinical article (*University Med. Mag.*, August, 1890), enforced by a number of briefly narrated cases in illustration, shows that direct surgical interference is by no means always necessary. When the anterior end of an inferior turbinate body is small and well located above the floor of the passage, he finds it much better to apply astringents or caustics to the free inferior border, which is apt to impinge upon the floor of the passage, or to operate with the view of increasing the diameters of the nasal passages by resecting the triangular cartilage and drilling away superfluous projections from the septum; plans which in his hands have been quite successful in reducing the bulk of the posterior masses.

He urges care to avoid mistaking for posterior hypertrophies a normal condition due to a congenital defect of the vomer, which he has termed *recedent*. Thus, when the vomer unites with the floor of the nose at the region of the maxillo-palatine suture, the posterior ends of the turbinates will approach each other, and even come into contact from absence of the septum which would have kept them apart, so that they appear to be protruding into the free space of the rhinopharynx.

Several instances are narrated in which treatment of concomitant pathological conditions succeeded in curing, or greatly relieving, catarrh and asthma without any topical treatment of the posterior hypertrophies; complete relief ensuing in some of the cases even without any diminution of bulk in the posterior hypertrophies. In other cases the posterior swellings diminished or disappeared.

Dr. Allen concludes that it is a good rule to suspend treatment of posterior hypertrophies until all other morbid conditions have been carefully corrected, when, indeed, it may be found, as in three of the instances cited, that they will not require treatment at all.

be reduced to 6 per cent.—and this ought to be reached in women previously operated upon—then the question of sexual mutilation becomes one to be very seriously weighed.

I have heard it claimed that the children of rhachitic women were of so little value that their mothers ought not to be allowed to generate. This has certainly not been the experience of this country, where rhachitic women have in many instances given birth to exceptionally fine children, some of whom are now living as adults and others as very robust babies or little children. When a rhachitic dwarf bears a fourteen-pound baby or one of twenty-two inches in length and perfect in proportion, as has happened in our country, we cannot see any evidence of inferiority. Rhachitic children are rarely such by inheritance, and if those born to rhachitic women become themselves rhachitic the disease generally arises in some defective hygienic conditions such as the parent was forced into through poverty. In the rhachitic unmarried pauper, or in the same even when married, the condition of extreme poverty may be considered in deciding the question of tubal ligation. One rhachitic woman of Ohio, whose tubes were ligated in 1880, has certainly had two fine Cæsarean children—a girl, now sixteen, and a boy, eleven—as their photographs in my possession attest. With a death-risk reduced to 6 per cent., why should such a mother not continue to bear children? This is a question also to be considered.

The two vital questions for consideration in regard to the Cæsarean operation are those of *time* and the *technique*, and these two must go hand-in-hand if the death-rate is to reach a low percentage. The woman must be in the best possible condition and the child vigorously alive, or the technique will be a weak dependence for success. We learn a positive lesson on this point from the fact that nine women out of thirteen, or $69\frac{3}{13}$ per cent., recovered after that frightful casualty, a Cæsarean horn-rip, of which we shall have more to say at a future time. What saved these women was certainly not the surgical skill, nor even the technique, for in not one was the uterus sutured. It must have been the condition of unexhausted strength and of health in the subjects. I have for twenty years been engaged in trying to prove that the operation of “puerperal cœlio-hysterotomy” is not in itself one of excessive danger, but becomes such when performed upon a woman made unfit for it by bad obstetrical management; and I believe this has been well established by the work in Leipzig, Dresden, Vienna, and in the hands of certain private operators, as also by my researches in the abdominal and uterine lacerations under casualties in pregnant women, amounting to over twenty cases.

tial to chromic-acid catgut as a material. He has completed an operation in twenty-four minutes. The woman lost was hopelessly ill with diseased kidneys, and had convulsions before the operation; she died of uræmia in four days, during which time the wounds had nearly healed.

Dresden, under six operators, furnishes a longer list of cases than Leipzig, but with a somewhat greater mortality, from the fact that a larger proportion of the women were operated upon under desperate circumstances. Prof. Leopold has had more Cæsarean deliveries than any man living; he had lost three women when he reached the present number of Prof. Zweifel. I cannot give the full record, but the percentage of loss has been smaller than the best Porro-Cæsarean work in Europe. The Porro record of all countries for the years 1885, 1886, 1887, 1888, and 1889 amounts to 157 cases, with 48 deaths, and 25 children lost. In the year of the lowest mortality (1888) there was a loss of $15\frac{5}{8}$ per cent., or 5 out of 37; but in the following year it rose to $32\frac{1}{2}$ per cent., or 10 out of 31.

The best Porro record in Europe taken from its beginning, is that of Milan, under eight operators. The mortality in 31 cases has been 9, with only two children lost; this makes the percentage 29 against $5\frac{5}{8}$ per cent. in Leipzig under cœlio-hysterotomy. Vienna has had many more Porro operations than Milan, but lost 15 women out of her first 31. For the past four years, her unpublished record will show a much diminished death-rate; that of Milan, during the same period, being far higher. We may safely rate this operation as having therefore a general average mortality of 28 per cent. In the year 1887 there were 53 "new Cæsarean" operations, with 11 women and 4 children lost, or a mortality of $20\frac{1}{2}$ per cent.; and in 1888, 79 operations, losing 18 women and 3 children, or 24 per cent. The Cæsarean record shows a decidedly lower average mortality in both the women and children than that of the Porro operation. Both are capable of a considerable reduction in the death-rate, but the exsection of the uterus must always add to the gravity of a Cæsarean delivery in cases where this organ is sound and the child living. Where the child is dead and putrid, where the body of the uterus is the seat of fibroids, or where there are septic symptoms due to the condition of the uterus, the Porro-Cæsarean method is to be preferred. In exceptional tumor cases, where exsection is not advisable, the tumor should not be removed.

The "conservative Cæsarean" operation is preferred by Prof. Sänger and by many Continental operators, who are opposed to removing the ovaries or tying the Fallopian tubes, especially in a married woman, who becomes thereby not only sterile, but, in some few instances under the former, sexually changed.¹ If the danger of Cæsarean delivery can

¹ This point is in dispute, but there are certainly instances in which this occurs.

of the tube, where it fuses with the other layers and forms an irregular meshwork of muscle fibres, with the fibres running in all directions.

Outside of this comes a thinner layer of longitudinal muscle, which is also very distinct; and upon this follows the subserous connective tissue.

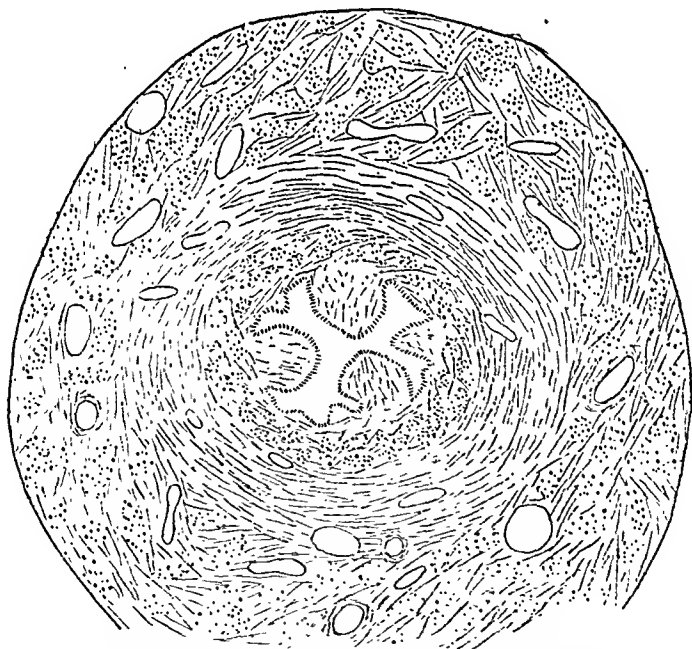
These are the two layers usually described by writers upon the subject, for they are readily seen on section from any part of the tube, except near the fimbriated extremity, where all the layers fuse together.

In some cases, however, the two layers become so blended throughout the entire length of the tube that it is impossible to separate them. (Fig. 4.)

These two layers correspond to the outer and middle coats of the uterus, and constitute almost the entire thickness of the wall of the tube.

Beside these two layers there is a third, corresponding to the third or inner muscular coat of the uterus. On cutting sections of the tube just at the cornu uteri (Fig. 1) one sees, just within the circular layer, a

FIG. 1.



Cross-section of tube at cornu uteri, showing the four primary folds of the mucous membrane and the three layers of muscle forming the tube wall.

well-marked but thin layer of longitudinal muscular fibres. This can be traced as a distinct layer for some little distance, but it gradually becomes thinner and thinner, and, fusing with the circular coat, finally disappears.

CONTRIBUTIONS TO THE NORMAL AND PATHOLOGICAL
HISTOLOGY OF THE FALLOPIAN TUBES.

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FOR convenience of description I will divide the tube into three portions (Henle¹): The isthmus, or the straight, narrow portion extending directly outward from the uterus; the ampulla, or the enlarged curved lateral part of the tube; and the infundibulum, or the fimbriated end of the tube. The isthmus is usually about 2 to 3 mm. in diameter, and the ampulla 6 to 10 mm. or more.

Roughly speaking, the tube may be said to consist of three coats: the serous (or, more properly speaking, the subserous), the muscular, and the mucous coats. Of these, the muscular and mucous coats are by far the most important.

THE SEROUS COAT.—As the tube lies within the folds of the broad ligament at its upper margin, it is consequently almost entirely covered by peritoneum, except below where the two layers of the broad ligament converge and the tissues of the tube and broad ligament become continuous. Beneath the peritoneal covering is a thicker or thinner layer of connective tissue, the subserous coat. This layer is most rich in bloodvessels, and in its inferior portion—that is, the part not covered by peritoneum—run most of the large vessels that supply the tube.

THE MUSCULAR COAT.—As the uterus and tubes were originally the same canal—Müller's ducts—and as in adult life they are continuous, it would appear only natural to suppose that their muscle layers would be continuous, and that the tube, like the uterus, would contain three distinct layers of non-striated muscle, as is really the case. This fact was known to Henle,² whose description of the tube is certainly far superior to any yet written; but it has apparently been lost sight of by all the later writers on the subject, such as Martin,³ Orthmann and Coe,⁴ for they mention only two coats. The greater part of the thickness of the tube is due to its muscular layer, which can only be studied properly in serial sections of the same tube, for the arrangement differs considerably in different tubes and even in different parts of the same tube.

The greater part of the muscular wall consists of a thick band of circular fibres which is usually quite distinct, except at the lateral end

¹ Henle: *Handbuch der Anatomie*, Bd. 2, p. 485.² *Ibid.*³ Martin, A.: *Handbuch der Frauenkrankheiten*, 2 Auf., p. 378.⁴ Coe, H. C.: "Anatomy of the Female Pelvic Organs," *Mann's System of Gynecology*, vol. i. p. 161.

follow the wonderful changes from the simple, irregular canal at the uterine end of the tube to the wonderfully complicated structure at the ampulla.

Like all mucous membranes, that of the tube has its epithelial lining, its *membrana propria*, and its connective-tissue framework into which muscle fibres frequently penetrate.

The mucous membrane is arranged in longitudinal folds, which vary in appearance according to the portion of the tube under examination.

Sections at the cornu uteri (Fig. 1) show a star-like lumen, which is formed by a few folds of the mucous membrane, usually four in number, though the number may vary from three to six. This is the arrangement of the entire tube at an early period of foetal life, and is the permanent arrangement throughout life in the bat and monkey. We may designate these folds as primary folds.

A short distance from the cornu uteri, secondary folds develop from the sides of the primary folds and thus produce a more complicated picture, as shown in Fig. 2, a section through the isthmus, one inch from the cornu uteri. This represents the general arrangement throughout the isthmus.

From these secondary folds, other folds may develop until at last each primary fold presents the most complicated appearance, so that the lumen of the tube is almost entirely filled with dendritic processes, as shown in Fig. 3.

This formation of folds attains its greatest development in the thickest part of the ampulla, and becomes less marked as one approaches the fimbriated extremity, where the original folded condition becomes once more apparent on the surface of the fimbriae.

If one only examined cross-sections of the tube, one could readily suppose that the mucous membrane was provided with villi with glands between them, similar to the follicles of Lieberkühn.

Longitudinal sections, however, show that these processes are not villi at all, but simply cross-sections of longitudinal folds, which increase in number as one approaches the fimbriated extremity.

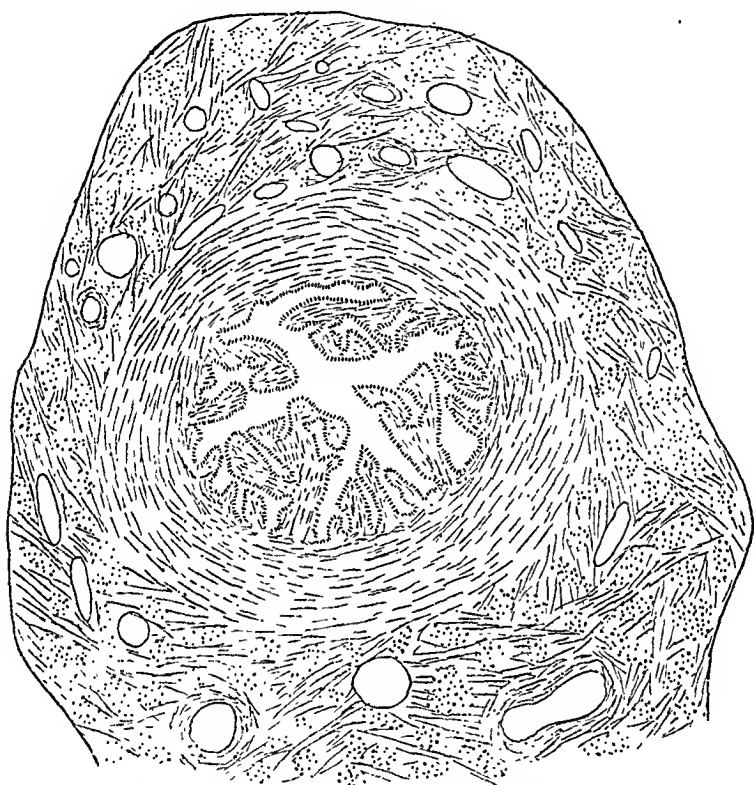
These folds are composed mostly of connective tissue, though they may contain a considerable amount of muscular tissue. The larger folds contain bloodvessels of considerable size and frequently large empty spaces corresponding to lymph-vessels.

The entire lumen of the tube is covered by a single layer of high columnar ciliated epithelium, under which comes an imperfectly developed *propria*.

All the cells are ciliated, and cilia can be seen in motion several hours after death; they are frequently as long or longer than the cells themselves. My statement that the epithelium is disposed in a single layer

Fig. 2 represents a section from the same tube about one inch nearer the fimbriated extremity than Fig. 1; and even at this distance from the uterus, the inner longitudinal layer has completely disappeared. It is apparently due to this fact that it is not mentioned by most writers, for sections from the middle portion of the tube show no trace of it.

FIG. 2.



Cross-section of the same tube at isthmus, one inch from Fig. 1, showing a more complicated arrangement of the mucous membrane and the disappearance of the inner longitudinal muscular layer.

THE MUCOUS MEMBRANE.—The most important and characteristic portion of the tube is the mucous membrane. Its arrangement is most remarkable, and in none of the English works is any adequate idea given of its complexity. The figure from Luschka,¹ which is usually given in the text-books, cannot pretend to represent a section from any part of the tube with any degree of accuracy.

It is only by the study of serial sections that the true arrangement of the mucous membrane can be appreciated, for in no other way can one

¹ Luschka: Anatomie.

shown by Frommel,¹ who, after tying both ends of the tube, injected it with Flemming's solution, and when it was hardened, cut sections. "The effect was that all the folds which were in contact were separated from each other, and the rounded lumen of the tube was lined by branching, tree-like processes, but no trace of glands could be found." The blood-supply of the tube is most abundant, especially on its lower margin, where bloodvessels, sometimes three to four mm. in diameter, are found.

An interesting condition which I have observed in the arteries of the tubes of multiparous women and which I have not observed in nulliparous women, is that they are often the seat of a marked endarteritis, similar to that found in the vessels of the uterus and attributed to a secondary growth of connective tissue, consequent upon the increase in size of the vessels produced by pregnancy—its object being to narrow the lumen according to the needs of the parts.

This is the only change that persists after pregnancy, for Thomson² has lately shown that the only change that takes place in the tubes of pregnant rabbits is an increase of the muscle cells to double their size, but that they return to their normal size within twelve days after labor, and show no trace of the past pregnancy.

The tube has three layers of muscle, corresponding to the three layers in the uterus, and not two, as usually stated.

Its mucous membrane is arranged in longitudinal folds, not villi.

Its epithelium is arranged in a single layer and contains no glands.

The arteries of parous women frequently show marked endarteritis.

DIVERTICULA OF THE TUBE.—In connection with the normal anatomy of the tube, I desire to call attention to an abnormality in its development which may bear a causal relation to the production of extra-uterine pregnancy. I refer to diverticula extending from the lumen into the wall of the tube, reaching almost to its peritoneal covering. They are lined by the typical single layer of ciliated epithelium, and correspond in all respects to the structure of the normal lumen of the tube.

They should not be confounded with the so-called accessory ostia of the tube; for, unlike them, they do not open on the outer surface of the tube, and, on simple inspection, give no evidence of their existence.

I have observed this anomaly on two occasions, one as follows:

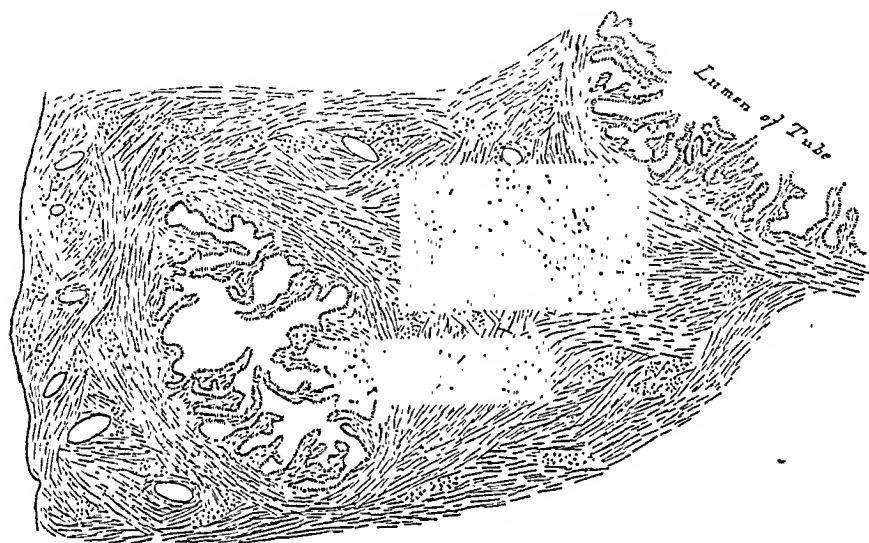
The specimen was obtained from a laparotomy performed by Dr. Kelly for a papillomatous cyst of the left ovary and a small corpus

¹ Loc. cit.

² Thomson: "Ueber Veranderungen der Tuben und Ovarien in der Schwangerschaft und im Puerperium," Zeitschrift f. Gyn., Bd. xviii. p. 273.

is supported by the statements of Henle,¹ Frommel,² and Orthmann.³ On the other hand, Hennig⁴ and others state that it is composed of several layers of cells; this statement was evidently made on the strength of observations made on sections which had been cut obliquely; for in that case one might readily suppose that the epithelium was composed of several layers.

FIG. 3.



Cross-section of the same tube through the thickest part of the ampulla, one inch from Fig. 2, showing the extremely complicated arrangement of the mucous membrane and the two layers of muscle composing the wall.

These three sections are from a tube which was obtained at the autopsy of a nineteen-year-old virgin dead of typhoid fever.

They are all drawn under the same power of a Winkel microscope with a Zeiss camera lucida, and so represent with tolerable accuracy the absolute increase in the size and complexity of arrangement of the tube from its uterine extremity to the ampulla.

The statements of Hennig,⁵ Bland Sutton⁶ and others that the tube contains glands is also based upon false observations, as was conclusively

¹ Handbuch der Anatomie.

² Frommel: "Beiträge zur Histologie des Eileiters," Verhandlungen der Deutsch. Gesellschaft f. Gynäkologie, 1886, p. 95.

³ Orthmann: "Beiträge zur normalen Histologie und zur Pathologie der Tuben," Virchow's Archiv, Bd. cviii. p. 165.

⁴ Hennig: Katarrh der weiblichen Genitalien.

⁵ Hennig: "Ueber die Blindgänge der Eileiter," Arch. f. Gyn., Bd. xiii. p. 156.

⁶ Sutton: "Glands of the Fallopian Tube and their Function," Trans. of the London Obstetrical Society, 1888, vol. ii.

On cutting serial sections, it was found to communicate with the lumen of the tube, and was consequently a diverticulum from it. The diverticulum at its point of departure from the lumen of the tube was about two mm. in diameter. In its further course it was surrounded by a narrow layer of circular fibres, outside of which came the interlacing network of muscular tissue.

A glance at Fig. 4 will show that the diverticulum ran obliquely through the thickened anterior muscular wall, and for a certain distance constituted a canal distinct from the lumen of the tube.

How often similar formations occur I am unable to state, for I have only found them twice, and the only reference to them in the literature was made last year by Landau and Rheinstein,¹ who found a similar case.

They bear some resemblance to the accessory tubal ostia of Richard,² Rokitansky³ and Klob,⁴ but do not open on the surface as they do.

They also bear a marked resemblance to the sieve-like epithelial structures found in the tube in tubal pregnancies, as described by Werth.⁵ As the tubes in my cases were not pregnant, we in all probability do not have to deal with the same formation, for I regard the structures mentioned by Werth as secondary to the changes produced by the tubal pregnancy.

Whether they be connected with these formations or not, I consider that they may hold a causal relation to tubal pregnancy. For what could be simpler than for the fertilized ovum to be driven by the action of the cilia into such a cul-de-sac, and to remain there and develop.

Such an origin would also explain the early rupture in these cases; for the ovum would only be separated from the peritoneal cavity by a thin layer of muscle, instead of the whole thickness of the tube wall.

In this opinion I am supported by a case of Landau and Rheinstein's:⁶ In a six weeks' tubal pregnancy, and in which the woman died from hemorrhage, on cutting sections of the pregnant tube they found the embryo in the upper part of the tube close under the peritoneum; while in the lower part of the tube, and separated from the ovum by a thick mass of muscular tissue, they found the almost unchanged lumen of the tube. From this observation they concluded that the pregnancy

¹ Landau und Rheinstein: "Beiträge zur path. Anatomie der Tuben," Arch. f. Gyn., Bd. xxxix, p. 273.

² Richard: "Pavill. multipliés, etc.," Gaz. Méd. de Paris, 1851, No. 26.

³ Rokitansky: "Ueber accessorische Tubarostien und ueber Tubaranhänge," Allg. Wiener med. Zeitung, 1859, No. 32.

⁴ Klob: Die path. Anatomie der weiblichen Sexualorgane, Wien, 1864. "Accessorische Tubarostien." p. 279.

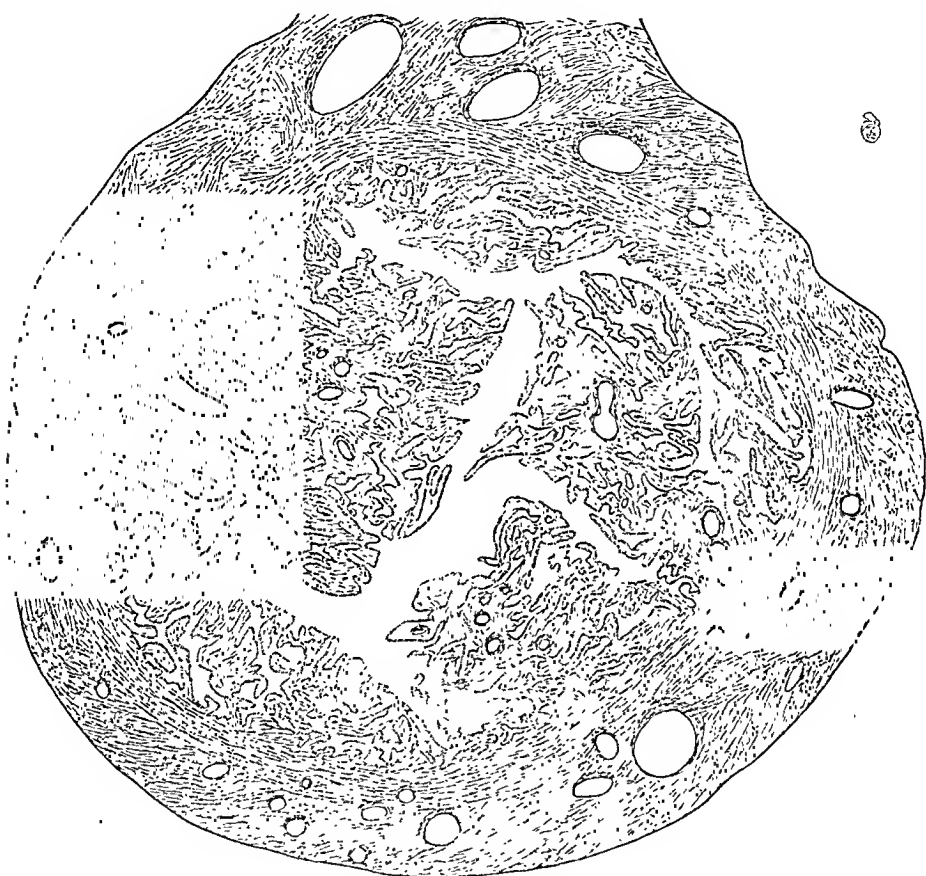
⁵ Werth: Beiträge zur Anatomie der Extra-uterinschwangerschaft, 1887.

⁶ Loc. cit.

luteum cyst of the right ovary. Both Fallopian tubes appeared perfectly normal and it was only on cutting sections of the right tube that this condition was discovered.

The sections were made from the ampulla of the tube and presented the following appearance: The lumen of the tube presented the characteristic normal appearance, but was situated excentrically in the tube, the anterior wall being at least twice as thick as the posterior. The

FIG. 4.



A portion of a cross-section of the tube at the ampulla. It represents the thickened anterior wall, containing a cross-section of the diverticulum from the lumen. It also shows how the layers of muscle may become blended together.

normal arrangement of the muscular layers was not observed, the entire wall being composed of fibres interlacing in all directions; otherwise it presented nothing abnormal.

In the thickened anterior muscular wall, somewhat below the level of the lumen and near the peritoneal covering, a small duct about one mm. in diameter was observed, separated from the lumen by a mass of muscular tissue about two mm. thick.

This "duct" presented the characteristic appearance of the tube, and was lined by a single layer of ciliated columnar epithelium, as represented in Fig. 4.

EMPHYEMA OF THE SPHENOIDAL SINUS.

DR. ALBERT RUAULT reports in detail (*Arch. de Lar., de Rhin., etc.*, June, 1890) an interesting case of empyema of the sphenoidal sinus apparently consecutive to rather rough manipulations in extracting nasal polyp with forceps. It was cured after trephining the sinus through the nasal passage, and prolonged antiseptic syringings. Four years later the patient came under observation with a slight empyema of the maxillary sinus, which was cured by extracting a molar tooth, penetrating the sinus, inserting a permanent canula, and antiseptic injections. This is claimed to have been the second case diagnosed, operated on, and cured; the first one having been by SCHAEFFER. Subsequently HERYNG reported four successful cases in his own practice, and E. BERGER has written on the subject, citing RUAULT'S case, which he had seen in the clinic, and cases communicated to him by QUÉNN, TROUSSEAU, and MOURS.

OZÆNA.

In an historical and bacteriological research on the nature of ozæna (*Arch. de Lar., de Rhin.*, April, 1890), DR. S. MARANO, of Naples, reviews antecedent opinions and researches and then details the result of his own careful investigations and experiments of control. He finds constantly a special form of microbe, *rhinobacillus*, which is not encountered in any other form of nasal disease, nor, to the best of his knowledge, in any other disease. It is capsulated but is entirely distinct from other encapsulated microorganisms studied by many other observers. It diminishes in abundance proportionately with the institution and efficacy of antiseptic treatment. It is the same micrococcus as has been described by LOEWENBERG, whose failure to find it encapsulated must have been due to defective technique in preparation. Its etiology has not been determined. The article is accompanied with a copious bibliographic index and a number of illustrations from the microscope.

HYPERPLASIA OF THE THYMUS GLAND.

DRS. KRUSE and COHEN report (*Deutsche med. Wochenschr.*, May 22, 1890) a case of sudden death of a boy two years of age, during tracheotomy for diphtheria, and due to hyperplasia of the thymus gland. The gland measured 71 mm. in length, 42 mm. in breadth, and up to 17 mm. in thickness. A tongue-shaped lobe, 25 mm. in length, reached above the upper end of the sternum nearly as far as the isthmus of the thyroid gland. The distance between the spine and the sternum measured only 21 mm. The gland compressed the trachea and both primary bronchi.

MENSTRUAL INFLUENCE ON LARYNGEAL DISEASE.

M. BAYER has reported (*Journ. de Méd. de Chir. et de Pharm.*, June 5, 1890) the case of a woman, twenty-three years of age, with tuberculosis of the right lung, in whose tuberculous larynx œdema of the arytenoid region took place at many menstrual periods. After an arrest of two years' duration, the condition recurred; so acutely at one period as to demand tracheotomy. Œdema recurred at the subsequent menstrual epoch, and in association with a bronchitis which terminated fatally.

developed in a diverticulum from the lumen, similar to the one just described.

The proof is not absolute, but the facts are extremely suggestive.

TWISTINGS OF THE FALLOPIAN TUBE.—I also desire to direct attention to a twisted condition of the tube, and will attempt to show that it may help to explain some conditions which were previously inexplicable. Freund,¹ of Strasburg, and one of his pupils, Schober,² were the first to direct our attention to the significance of this condition, and my observations tend to substantiate their statements.

A peculiar and inexplicable fact in the development of the Fallopian tubes is that at an early period they undergo a process of twisting which begins at the uterine end of the tube and extends outward until at last the entire tube presents a corkscrew-like appearance.

What causes this twisting is absolutely unknown, unless we suppose it to be due to the resistance offered to its growth by the surrounding parts, as in the case of the sweat-glands.

In a foetus of five months this process is quite marked (Fig. 5, *A*), and it gradually increases until the eighth month, when it has reached its highest development.

At this period it presents a corkscrew-like appearance with from six and a half to seven and a half twists, beginning at the uterine end. (Fig. 5, *B*.)

This condition I have noticed in several cases.

In the period between birth and puberty the tube is gradually untwisted, beginning at the uterine end and extending outward, until at puberty the twists have entirely disappeared or are only represented by a mild curve in the course of the tube.

This process is represented in Fig. 5, *C*, from a three-year-old child, and Fig. 5, *D*, which represents the normal tube at the time of puberty.

What significance this process may have in the development of the tube I am unable to state; though even during childhood it may become so marked as to cause the tube to be twisted apart, as has been observed by Rokitsansky.

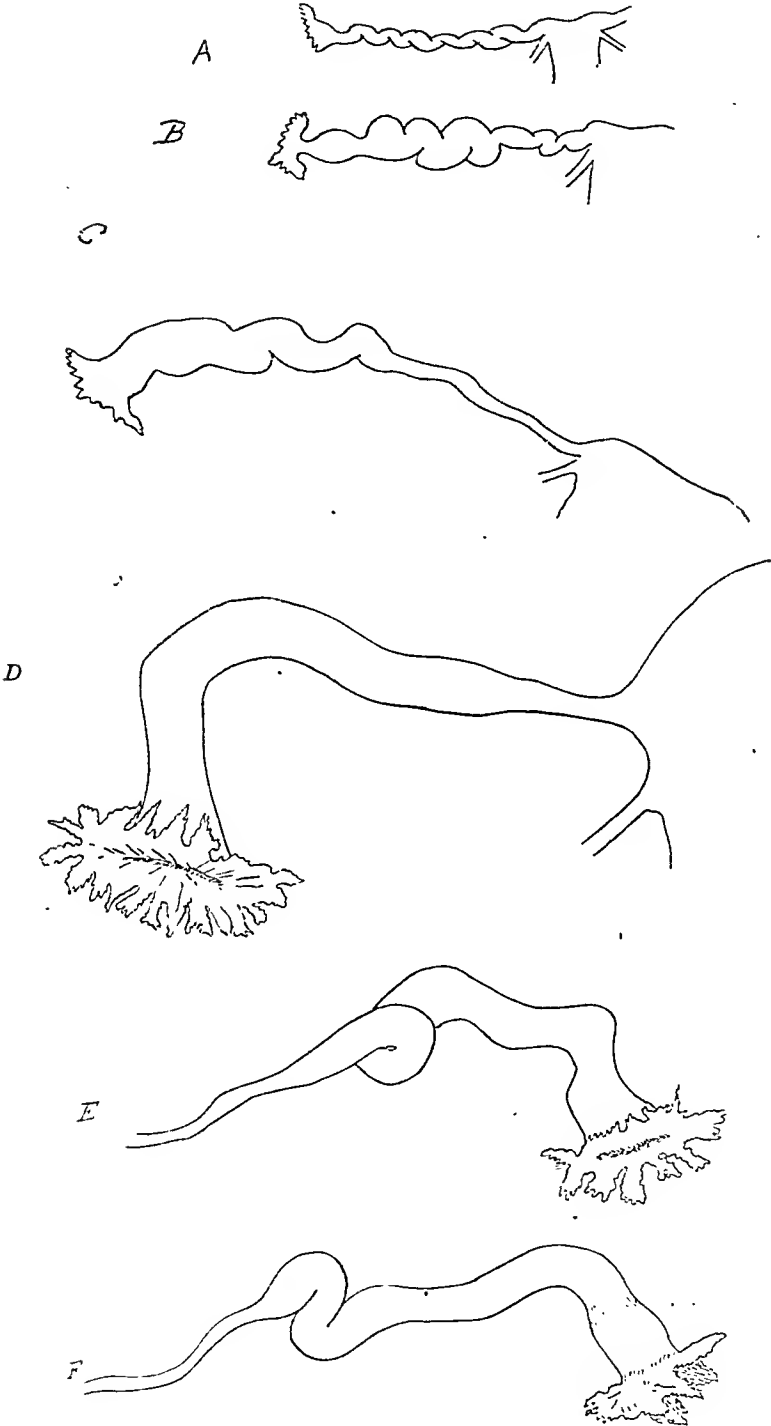
Owing to lack of development or some unknown cause, the twisted condition of the tube may persist throughout life. Most of the cases in which this has been noticed are in women who are poorly developed sexually.

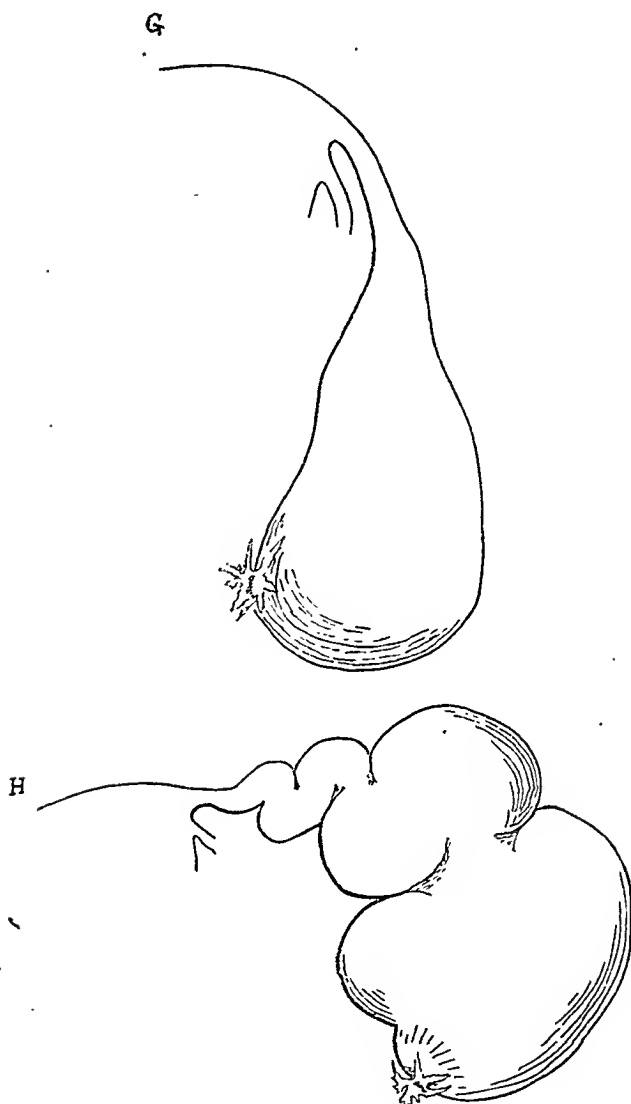
It will be readily understood that such a condition in an adult woman may lead to serious consequences.

¹ Freund: "Ueber die Indicationen zur operativen Behandlung der erkrankten Tuben," Volkmann's Sammlung klinischer Vorträge, 1888, No. 323.

² Paul Schober: "Ueber Erkrankungen gewundener Tuben." Inaug. Dissert., Strasburg, 1889.

FIG. 5.





A represents the tube of a five-months' foetus, with the twisting well marked. *B*, the tube of an eight-months' foetus with the twisted condition at its highest development. *C*, the tube of a three-year-old child, showing the gradual obliteration of the twists. *D*, the tube of a well-developed girl at puberty. *E* and *F*, the tubes of a sterile married woman, aged thirty-nine years, who was otherwise perfectly healthy. *G* represents a hydrosalpinx developed in a normally arranged tube, and *H* a hydrosalpinx developed in a twisted tube.

In the first place, one or more of the twists may be so marked as to cause a total occlusion of the lumen, just as one may do with a rubber tube. The consequence of such an occlusion would be that the woman would be sterile, for the ova could not pass beyond it on their passage to the uterus, nor the spermatozoa above it on their way to the ovary; and

if the condition were the same on both sides, the woman would be perfectly sterile. Fig. 5, *E* and *F*, represent both tubes from a sterile woman aged thirty-nine years, who was otherwise perfectly healthy.

A similar condition of the tube may cause retention of the normal secretions and so give rise to a hydrosalpinx, which may be lobulated or not, according to the number of twists by which the lumen is occluded. Fig. 5, *G*, represents a hydrosalpinx in a normal non-twisted tube, and Fig. 5, *H*, in a twisted tube.

I desire to record the following case of hydrosalpinx, which I believe was caused in this way. I will quote from my records—"January 26, 1891: Tube and ovary from left side. Tube converted into a lobulated hydrosalpinx, immensely distended, and wound around the ovary; 19 cm. long, 6 cm. in widest and $\frac{1}{2}$ cm. in thinnest part. For a distance of 7 cm. from uterus the tube is apparently unchanged and about 5 mm. in diameter, then it suddenly expands into the lobulated hydrosalpinx, which was densely adherent to the ovary. The median end of the tube is perfectly pervious, but it is impossible to pass a fine probe from it into the hydrosalpinx, for it appears to pass into a cul-de-sac and go no further. On cutting open the dilated end of the tube and probing toward the uterus, on giving a slight twist the probe readily passed into the undilated part, thereby giving the impression that the constriction was caused by a twist in the tube."

This certainly appears to be a rational explanation for some cases of hydrosalpinx. In other cases the twisting may not totally occlude the tube, but only cause a narrowing of its lumen, and this also may lead to serious consequences.

If, for example, the tube becomes inflamed, the swelling of the mucous membrane may be sufficient to cause total occlusion or to so narrow the lumen that the secretions collect and greatly interfere with healing by preventing drainage of the parts.

If we have a purulent salpingitis, nothing is simpler than for the apposed surfaces of the twisted portion, which have lost their epithelium, to become adherent and thus produce a total and permanent occlusion and rapidly form a pus cavity. And according as one or more twists become imperforate, we get a more or less lobulated mass.

These twistings, of course, cannot be diagnosed during life, except in cases in which they lead to the formation of lobulated tumors, when the lobulated form will distinguish them from the more rounded or pear-shaped tumors, which develop from the normally shaped tube.

This abnormality, however, deserves consideration, for it may explain many cases of sterility, some cases of obstinate catarrhal salpingitis, and many cases of hydro- and pyosalpinx.

REVIEWS.

A PRACTICAL TREATISE ON DISEASES OF THE SKIN. By HENRY G. PIFFARD, A.M., M.D., Clinical Professor of Dermatology, University of the City of New York; Surgeon-in-charge of the New York Dispensary for Diseases of the Skin, etc.; assisted by ROBERT M. FULLER, M.D. With fifty full-page original plates and thirty-three illustrations in the text. New York: D. Appleton & Co., 1891.

THIS is an *édition de luxe* of a work covering not the whole but a large and essential part of the great field of cutaneous medicine, with numerous illustrations of disease, chiefly reproductions of photographs taken by the author, many of which are so good as to constitute the chief element of value in the book. The whole is a striking evidence of the courage and ability of the author.

Only a fearless contributor to science would venture upon questions in the discussion of which the schoolmen have produced ponderous tomes, and dismiss the same in as many pages. For example, in touching the enormous group of the syphilodermata, to whose peculiar symptoms such writers as Duhring, Crocker, and Keyes have devoted from two to three score of folios, and the mere references for which, in the treatises of such authors as Jullien and Fournier, would alone furnish a good-sized volume, Dr. Piffard contents himself with ten pages merely of the work before us and the ten portraits which serve to explain the text. Let not the reader of these lines think that in commenting thus upon the fruit of our author's labor the contrast suggested is designed to convey a sarcastic reproach. Far from it. There is no more constant mark of the man of genius than his power to compass this particular end. Where others toil with infinite pains over the obstacles in a tortuous road, the mind of the explorer traverses the direct and smoother path which he soon pursues as a pioneer. Louis XIV. could express the whole of his autocracy in an epigram. Haden has portrayed a landscape with a few touches of his burin. Certainly no observant physician can study these pictures of disease without gaining some insight into the problems which other writers have required so much space even to adequately propose to the understanding. The best of the illustrations are: Fig. 1 (erythematous eczema of the hand), Plate II. (symmetrical eczema of the knees), Plate IV. (psoriasis of the sole), Plate XIV. (dactylitis syphilitica), Plate XXV. (elephantiasis), Plate XXVI. ("seborrhœa kerativa"), Fig. 19 (an admirable portrait of the pediculus pubis, the best thus far exhibited by any contributor to the subject), Plate XLVIII. (ichthyosis), and Plate L. ("psorospermosis"). The portraits of psoriasis of the general surface of the body are some of them good, but not superior to those which have been before

published. The hand represented on the upper portion of Plate III., described as the seat of an eczema, looks suspiciously like those displaying a palmar syphiloderm, an appearance which would doubtless be dispelled if the original colors of the exanthem could have been reproduced. Indeed, allowance must be made in studying all of these interesting plates and figures for the absence of color-effects, upon which the diagnostician relies, in part at least, for his conclusions. But it is excellent practice to dispense at times even with the aid of vision in making some investigations of disease.

Perhaps the gravest charge that can be brought against our author in the production of this really creditable work is one which he must bear with many of his clan—that of burdening dermatology with new names. There was a day of joy in medicine when the senior Hebra with unsparing hand swept into the street the dust of dermatology, the rubbish of its meaningless names which had accumulated during the centuries. For a brief time thereafter it was a reproach to give a new title to a disease of the skin, a name likely to share the fate of “rupia,” “lichen eczematodes,” “porrigo larvalis,” and the like. But as time passed the temptation grew great, opportunities multiplied, and men “rose up which knew not Joseph.” The greatest sinner on this score is one of the most prolific contributors to cutaneous medicine, and not a few of his peers in the late Congress at Paris besprinkled their discussion of diseases of the skin by distinguishing that upon which they engrafted their own names from another to which they did not refuse to give the name of a colleague. Even the newborn “eczema seborrhoicum” of Unna, Dr. Piffard designates as “sudolorrhœa,” a faulty term if employed to suggest the characteristic picture of the process, though our author accurately describes the malady in the text of his work. “Seborrhœa kerativa” and “mammillitis maligna” are novelties in name if not as to the process they represent. No reader of these pages familiar with the text-books on diseases of the skin written by the first ten authors in dermatology of America and Great Britain, would recognize, without some study, the classical and well-named *tinea versicolor* in “chromophytosis.” There is no law binding upon any writer to observe strictly the nomenclature of the American Dermatological Association. That nomenclature is unquestionably defective and can doubtless be revised with enormous advantage. But with all its defects it has in this country done more in the direction of systematizing a knowledge of diseases of the skin than an entire edition of the most valuable treatise on the subject that has yet appeared. It would have been a gracious and valuable concession if the man who once filled the honored position of president of that Association had at least given the American titles of diseases of the skin in brackets after those of his own preference. The reason he has not done this has already been shown. In all seriousness, it is admitted that his is the mind of a genius impatient of barriers and disdainful of routine.

But let not the soul of the average professional man searching for the truth in cutaneous disease despair of finding his facts beneath this enormous and accumulating rubbish of names, many of them with the cards of their proprietors affixed to each. There is no evil under the sun but carries within it the germ whose development is its doom. When the burden becomes at last too heavy, and the shoulders beneath sufficiently impatient, the hour strikes for rebellion, and lo! the reformer is at hand

for the relief of the victim of oppression. He that will do this great thing for dermatology is probably living to-day. He will almost surely be an American, but he will know all that is worth knowing of the lore of the schoolmen and of the dicta of the masters. He will have scanned all the fields that have been opened to the eye by the microscope, but he will be broader than a bacterium and not mensurable with a micrometer. And he, too, shall sweep into oblivion heaps upon heaps of idle names whose chief value is to furnish the landmarks dear to the historian, showing how laboriously and by how many devious roads man climbs to the light. He will, however, do more than this. He will show that it is indeed quite rare for a man to suffer from a disease of the skin whose morbid products intoxicate his liver, his spleen, or his kidney, and that it is quite as rare for any one of these organs to generate a poison that induces a disease of the skin.

The chapter of special interest in this volume, one in fact of such importance in the mind of the author, that he specially refers to it in his preface, is that which concludes the list, touching upon psorospermiosis. The opinions here stated are those already published over Dr. Piffard's signature in the *Journal of Cutaneous and Venereal Diseases*, issue with which was speedily taken by Dr. Lustgarten in the same periodical. The facts are nearly these:

In the year 1889 Darier and Wickham exhibited to the members of the Congress of Dermatology and Syphilography in Paris, a patient displaying the symptoms of a disease termed by them "psorospermose folliculaire végétante," illustrating the results of invasion of the skin by psorosperms or coccidiæ (also termed pseudo-naviculæ), parasites classed by some zoölogists among the protozoa; and considered by others as algæ. They are not rarely found parasitic in the viscera of the vertebrata, particularly in the livers of ill-fed rabbits.

Soon after appeared Wickham's monograph,¹ practically exhausting the subject to that date, claiming not only for the disease exhibited in the Paris patient, but also for Paget's disease of the nipple, molluscum sebaceum, and possibly other maladies, an origin due to parasitic invasion by psorosperms. Dr. White, of Boston, had already described one patient in this country (another since that date) exhibiting all the symptoms of the so-called psorospermiosis of Darier and Wickham. The bodies figured by Wickham in his work are those recognized in London by Delépine, Bowlby, and Hutchinson, Jr., who failed to get definite reactions by which to identify the coccidiæ and to distinguish them clearly from altered epithelial cells. The parasites appear as oval, roundish, or spindle-shaped bodies which later elongate and become in turn pyriform or fusiform, eventually showing long, coiled, sickle-shaped filaments within a capsule not unlike spermatozoa.

Dr. Piffard, after employing polarized light by transmission through sections of tissue containing the so-called psorosperms, concludes that they are rete cells undergoing a species of corneous degeneration; and it must be confessed that the evidence in favor of this view is slowly accumulating. Thin, of London, under date of May 16, 1891, reports that in cases of Paget's disease he had found an "immense number" of these bodies, "psorosperms," and believes that "they were nothing else

¹ Contribution à l'étude des Psorospermioses Cutanées et de certaines formes de Cancer; Maladie de la peau dite "Ma'adie de Paget," par le Dr. Louis Wickham. Paris, 1890.

than epithelial cells in various stages of transformation." Lastly, Messrs. Shattock and Ballance, of London, taking psorospermial material from the livers of rabbits, have inoculated therewith other rabbits, monkeys, dogs, and rats with negative results, the injections into the jugular vein, "vaccination" experiments, etc., producing merely hyperplastic products at the site of injury. These authors claim that Darier's views must be tested according to Koch's postulates, experimental infection of a human being or lower animal being produced by fluids obtained from culture of the products of a carcinomatous lesion, or from the "psorosperme folliculaire végétante" of the French writers.

Dr. Piffard's style is clear and attractive; at times the philosophical amplitude of even his shortest sentences is highly suggestive. He has made here a valuable contribution to the clinical resources of the student of dermatology, and deserves great credit for the manner in which he has produced both text and portraits. There are a few errors in the book, the most conspicuous of which occurs in describing "chromophytosis" as due to the "microsporon Audouini" (p. 113), as this fungus was first named by Eichstedt, of Greifswald, in 1846, as the *microsporon furfur*. The *microsporon Audouini* was named by Gruby after Audouin, and was the fungus supposed to be effective in the production of alopecia areata; but it has since shared the fate of the impostor who claimed to have first discovered the parasite productive of scabies, and whose name survives only among the French, by whom that disease is still called "Gale."

J. N. H.

DIABETES: ITS CAUSES, SYMPTOMS AND TREATMENT. By CHARLES W. PURDY, M.D. With Clinical Illustrations. Pp. viii., 184. Philadelphia and London: F. A. Davis, 1890.

DR. PURDY'S little volume is a meritorious effort to set forth the present status of our knowledge on the subject of diabetes, "in such practical and concise form as shall best meet the daily requirements of practice," and is based upon "a careful study and recorded observation of the disease, extending over a period of twenty-one years." He has "endeavored to bring out prominently the leading features of diabetes as it occurs in the United States, together with the natural resources of the country best suited to the disease, as the waters, foods, and climate, since the very extensive range of these entitles them to rank in point of efficiency for the relief of the diabetic patient as at least equal to those in any other land or clime."

The first section is devoted to Historical, Geographical, and Climatological Considerations of Diabetes Mellitus from the data afforded by mortality statistics of the census of 1880, not including States and Territories furnishing a total death-list of less than 5000. The author has compiled a number of tables illustrative of the comparative mortality from diabetes in different portions of the United States and the relations of the mortality to temperature, rainfall, elevation, population and urban and rural residence. By these tables he apparently demonstrates that, in the United States at least, cold and altitude are the chief climatic features which determine high mortality from diabetes. Thus, for instance, in the State of Vermont we have 6.36 per thousand deaths

attributed to this disease; according to the author, the highest ratio of any place in the world. Vermont is noted for its long continued and severe winters. Maine, the climate of which is very nearly the same as Vermont, gives the next highest mortality in diabetes in the United States, 4.41 per thousand. The difference between Maine and Vermont is attributed to the greater altitude of the latter. A striking contrast is afforded by Alabama, where the mean annual temperature is about 75° F., and the elevation above the sea is considerable. The mortality from diabetes sinks to the lowest ratio in the country, 0.55 per 1000 deaths.

With Dickinson, and against Sir William Roberts, Purdy finds a mortality from diabetes among the rural population greater than among the dwellers in cities. In the North Atlantic coast region the mortality among the rural population is 3.55 per 1000 deaths, and among urban dwellers 1.76. In the Gulf coast region, on the contrary, the rural mortality is 0.49, the urban 1.56. The author advances the following explanation of these facts:

"Cold greatly increases the mortality from diabetes. In cold climates those who are best sheltered from climate suffer least from disease. This fact is brought out in strong contrast in the United States, because there the houses are constructed with a view to greater warmth and comfort than in Europe. In the warm climates of the South the evil effects of cold no longer appear, and the atmospheric conditions affecting the disease are chiefly those of purity. The country people are able to live in the open air the year round without exposure to cold or chill, and oxidation obtains its greatest activity. In the cities more or less confinement and impurity of atmosphere is inevitable, which tends to impede oxidation and give greater impetus to the disease."

The mortality reports of the United States census for 1880 record no death from diabetes among either the Indian or the Chinese population of the country. The Indians are spare eaters and subsist almost exclusively on nitrogenous foods, leading at the same time an active out-of-door life. The exemption from the disease enjoyed by the Chinese bears out the record from their native land, and appears to be due to a race peculiarity. One of the most important features, and the most deplorable one of the careful statistical investigations of the author, is that the relative mortality from diabetes in this country has been very decidedly on the increase during the last forty years. In 1850 it was 0.72 per 1000 deaths, and in 1880 it was 1.91 per 1000 deaths. The most marked increase was between 1860 and 1870—nearly 100 per cent.; from 0.98 to 1.70. The author rationally attributes this to the decided change in the habits of the nation consequent upon the Civil War. Previous to 1860 we were "a frugal and economical people, enjoying but moderate luxuries in living." The inflation of the currency; speculation; political and social demoralization, with its concomitants of luxurious living and extravagance; excessive labor and widespread dissipation, have inevitably increased the morbidity and the mortality of neuroses in general and diabetes among the number.

The sections devoted to Physiological and Pathological Considerations, to Etiology, Morbid Anatomy and Symptomatology, are clear, sufficiently full for the purpose of the work, and on the whole, reliable.

Treatment is considered under three divisions: Dietetic, Medicinal

and Hygienic. After varied and laborious experiments with substitutes for bread the author found the following method most satisfactory. The patient is permitted to use his own regular table bread, but the allowance is limited to half the usual amount. If sugar still appears in the urine the bread is further reduced by one-half, and if the sugar still persists bread is prohibited absolutely. According to the author's experience, if the patient cannot assimilate two to three ounces of bread daily without excreting sugar in the urine he cannot assimilate any substitute therefor, and under such circumstances the sooner all bread is stricken from the diet list the better. The author has never seen good results from an exclusive milk diet, and seems rather inclined to limit the amount of milk allowed to the patient. He gives a useful list of wines which may be permitted and those which should be prohibited, on the basis of analysis for sugar. All mineral waters are permissible as beverages and some of the alkaline waters he considers as curative. Among medicinal agents he discusses opium, antipyrine, the bromides, ergot, arsenic, iodoform, jambul, oxygen, and the alkalies. He finds limited use for opium, codeine being preferable in cases showing a continued high percentage of sugar in the urine despite the institution of strict dietetic measures; but he believes that sooner or later the drug has to be abandoned on account of its damaging effects on nutrition. Antipyrine is unsuitable for lengthy periods of administration in doses of forty-five grains a day, and in smaller doses is not claimed to modify the disease. Moreover, it is likely to cause albuminuria, and therefore cannot be considered a safe agent for use in these cases. Ergot has a useful influence over mild cases in which the patient retains good digestive powers. He has seen little benefit from either Giliford's or Clemens' solution of arsenic bromide, even when combined with Martineau's lithium treatment. The chief benefits he has obtained from arsenical preparations in diabetes have been from arsenite of iron in cases complicated with anæmia or malaria. Iodoform, if used carefully in doses of from one to three grains repeated three times a day or in sufficient doses at bedtime, continued for two weeks and resumed after an interruption of two weeks, seems to cause a diminution of thirst, of polyuria and of the amount of sugar excreted. The use of oxygen by inhalation is highly lauded, from three to five gallons of a freshly made gas being administered twice daily. Hydrogen dioxide water (one to two drachms, largely diluted with water) may be used, but is less efficacious. The alkalies are believed to increase the oxygen-holding powers of the blood. Stress is laid upon the avoidance of constipation, of mental emotion and of fatigue, as these are likely to lead to the production of coma. In addition to avoidance of fatigue, the points to be attended to in the hygienic treatment are proper aëration, proper clothing, and proper temperature. Besides hygienic clothing, in order to preserve the warmth of the body, warm baths followed by thorough rubbing of the skin are recommended. A moderate degree of exercise in the open air is necessary, and habits of regularity must be observed in eating, drinking and sleeping. A number of illustrative cases are recounted. A section is devoted to diabetes insipidus. A short but well-selected bibliography is appended.

S. S. C.

DERMATOLOGY.

 UNDER THE CHARGE OF

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AND

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PRURIGO INFANTUM; PSORIASIS-ECZEMA; PRIMARY PIGMENTED SARCOMA OF THE SKIN; XERODERMA PIGMENTOSUM; DERMATITIS HERPETIFORMIS.

Under the caption "Remarks on various diseases of the skin," STEPHEN MACKENZIE (*Brit. Med. Journ.*, January 4, 1890) calls attention to the above diseases in a brief and practical manner. "Prurigo infantum," of the author, is the affection described by many English writers as "lichen urticatus," which usually begins in early life, often persists, and disappears gradually as the child gets older. Mackenzie is of the opinion that where it persists it becomes what is known as Hebra's prurigo. In the majority of cases local treatment only is valuable, the usual antipruritic remedies being recommended.

A case partaking of the symptoms of both psoriasis and eczema is given, at one time resembling psoriasis, at another moist eczema, the condition being known as eczematous psoriasis. The ordinary treatment for psoriasis was not appropriate, the remedies useful in eczema proving more beneficial.

An example of primary pigmented sarcoma of the skin, occurring in a man aged forty-five, corresponding very definitely to Kaposi's type of the disease, is recorded. The disease shows preference for the hands and feet, and is characterized by firm or hard tumors, or fungating or ulcerating masses of a bluish color. It occurs chiefly in the laboring classes, especially in those subjected to fatigue and hardship. A few cases have recovered under the use of arsenic, especially when given subcutaneously.

Xeroderma pigmentosum, a rare disease, is characterized by pigmentary spots like freckles, mainly on the face, neck, forearms, and hands, beginning in early life, later atrophic spots and telangiectases appear, and eventually warts, excrescences, and fungating growths, which are epitheliomatous or papillomatous. No treatment has proved successful in arresting the process.

Two cases of dermatitis herpetiformis are recorded, both in men aged about forty. In one patient the disease was of a severe type, and had persisted for four years, showing the greatest variety of manifestations. Arsenic exercised the most influence, but fell short of curing the disease.

 ON THE NATURE AND TREATMENT OF ECZEMA.

UNNA believes (*British Journal of Dermatology*, August, 1890) in the specific nature of eczema, the essential cause of which is the inoculation of a germ. This germ is doubtless of vegetable nature, and increases and pro-

given in Chapters V. and VI. Chapter VII. concludes the book with original observations in diseases of the choroid. It will be noticed that the author has not adhered to that generally accepted classification of retinal and choroidal diseases which would seem to have been based largely upon the changes in the pigment coat. He has noticed alterations in the pigment in both retinal and choroidal disease, as they seemed to him dependent upon coexisting inflammation of one or the other membrane, and has described specific changes—hypertrophy and atrophy—of the pigment layer in separate sections.

The illustrations are numerous and well executed. Many are after Dr. Loring's own sketches and others are reproductions from Jacger and Liebreich. In addition to the black-and-white prints in the body of the book there are at the end six plates, each containing two chromolithographs. The fault common to most attempts to portray diseases of the fundus—exaggeration of the abnormal conditions showing too great a contrast between healthy and unhealthy structures—is found in many of these illustrations.

The editor has done well to limit his duties chiefly to the arrangement and classification of the material of the author, and as he says in the preface, "I found there was so much original matter in it, so much that from its very nature must provoke discussion and argument, that I determined to publish it as it stood, without addition or correction." The wording throughout clearly conveys the author's meaning, and the ideas are purposely clothed in a conversational rather than a polished literary garb. Indeed, in his effort to be concise, the author has in a few instances fallen into the error of colloquial expression. Thus on p. 105 he uses the following language: "Not a single case of the slightest retinitis or neuro-retinitis can I find in all the literature of these cases, *let alone a choked disc.*"

The type is of good size, the paper white and thick, typographical errors are few; in short, the book is in all respects admirably printed.

The reviewer earnestly commends the work to students of ophthalmoscopy as the best treatise in the English language on the subject.

H. F. H.

HYPNOTISME ET CROYANCES ANCIENNES. Par le DR. L. R. REGNIER, Lauréat de l'Académie de Médecine, etc. Avec 46 figures et 4 planches. Paris, 1891.

HYPNOTISM AND ANCIENT BELIEFS. By DR. L. R. REGNIER, Laureate of the Academy of Medicine.

THIS book has a distinct and special value. It differs from the common run of works on hypnotism, and has a literary merit which few of them possess. This is partly because it leaves the beaten track. It does not deal altogether with the modern "craze" called hypnotism, but pursues its subject in the distant past. It introduces us to the mysteries of the Rig-Veda of the Hindoos and of the Zend-Avesta of the ancient Persians. It culls little items of interest from a papyrus found under the ruins of Thebes and from the cuneiform inscriptions of the ancient

TEXT-BOOK OF OPHTHALMOSCOPY. By EDWARD G. LORING, M.D. Edited by FRANCIS B. LORING, M.D. Part II. Diseases of the Retina, Optic Nerve, and Choroid: Their Varieties and Complications. New York: D. Appleton & Co., 1891.

THE reviewer's task is an agreeable one when he can praise without qualification; when the material presented to his critical analysis is of such real value as to justify him in commending the work to fellow-students; and when he feels that the knowledge gained from it better equips him for his daily work.

Dr. Loring's work is original and practical; it is a record of thorough and painstaking care in the observation of abundant clinical material. Not satisfied with the description of the coarse lesions so often exclusively given in text-books, his investigations have included subjects slighted or altogether neglected by other writers, subjects which to careful practitioners are matters of the highest importance. His studies, for example, of the minute changes in the light-reflex, color, pulsation, etc., of the retinal vessels taught him, and through his book teaches us, the grave systemic disturbances of which they are the forerunners. By diligent care in the use of the mirror, changes of diagnostic and prognostic significance are detected which escape the superficial and routine observer. Thus the field of ophthalmology is broadened by Dr. Loring's work. He teaches us how to diagnose by the mirror heart and blood irregularities, valvular disease, splenic, kidney, cerebral, and spinal affections in their incipency, and proves the ophthalmoscope to be indispensable to the physician. The ophthalmic surgeon who absorbs the knowledge contained in this book is something more than an "eye doctor"—recognizing, as he must, that the eye is a connected part of the whole organism, he becomes an expert in the observation and interpretation of its signs. The fine distinctions between the healthy and unhealthy appearances of the eye-ground are especially noticed and emphasized, and it is in this particular that the eminently original studies of Dr. Loring are of great value.

The book contains 253 pp., divided into seven chapters. The first considers the vascular disturbances in the retina, such as changes in the length, breadth, and walls of the arteries and veins; vessels of new formation, aneurism, embolus, thrombus, stasis, hemorrhage, and anæmia, and of their causative relation to general disease. Chapter II. deals with an intermediate stage between purely vascular changes and those associated with signs of inflammation, designated by Jaeger as "irritation" of the retina. The importance of this chapter is well expressed in its opening paragraph. "This form of congestion, although chiefly distinguished from hyperæmia by the presence of functional disturbances, has yet some physical characteristics and features of its own which it is important to notice, especially in these days when all symptoms of asthenopia are referred to an error of refraction, should any chance to exist, even of an infinitesimal degree." Chapter III. treats generally of the characteristics of retinal inflammation, while Chapter IV. classifies and describes minutely the specific forms of inflammation. Particularly clear and instructive are the sections devoted to a description of albuminuric retinitis, retinitis pigmentosa, and detached retina. A classical account of diseases of the optic nerve, which leaves nothing unsaid, is

ŒUVRES COMPLÈTES DE J. M. CHARCOT. HÉMORRHAGIE ET RAMALLISSEMENT DU CERVEAU, MÉTALLOTHÉRAPIE ET HYPNOTISME, ELECTROTHÉRAPIE. Tome IX. Paris, 1890.

COMPLETE WORKS OF J. M. CHARCOT. CEREBRAL HEMORRHAGE AND SOFTENING, METALLOThERAPY AND HYPNOTISM, ELECTROTHERAPY.

As we are told in the preface by the editor, Bourneville, this volume comprises three parts of unequal importance. The first is devoted to diseases of the brain, especially to cerebral hemorrhage, and some of its complications, immediate and remote. In the second part have been collected the numerous papers of Charcot on metalloscopy, metallothrapy and hypnotism. Scattered everywhere in the medical journals or in the transactions of the learned societies, it was very difficult for physicians to have recourse to the original publications, or to gain an exact idea of the work of the chief of the school of the Salpêtrière on these subjects.

It is further pointed out with what circumspection Charcot undertook the study of hypnotism—neglected, discredited for many years, and regarded as difficult by the best minds. On this point, as on all others, the learning of Charcot rests on a most solid basis, on facts submitted to the severest tests, especially as the most pronounced scepticism prevailed at the time. His facts are to-day definitely accepted by the great majority of physicians who are seriously occupied with this department of neurology.

In the third part is reproduced a lecture by Charcot on static electricity, and which to some extent is related to the other subjects.

Among the more important papers in the first part is the admirable research of Charcot on the Pathogenesis of Cerebral Hemorrhage, published originally in 1868; on Hemorrhage into the Posterior Third of the Internal Capsule, published in 1875; on Neo-membranes of the Dura Mater, 1860; and on Arthropathies depending on Lesions of the Brain and of the Cord, 1868. The last mentioned is especially interesting.

In the second part the more important are, Hints and Observations on Metalloscopy and Metallothrapy, embracing among other things a consideration of the action of magnets, and published in 1877; and another on the same subject, in which the phenomena of transfer are considered; others on Catalepsy and Somnambulism follow. The most interesting of all, however, are his studies on Hypnotism among Hysterical Subjects, published in 1881, and on which subject one of his pupils, Paul Richer, afterward published a volume. Surely the collection of papers before us shows how much we owe the knowledge we possess of these obscure subjects to Charcot and his school.

Thus far nine volumes of Charcot's works have been published, and a tenth is to follow. All of them relate to neurological subjects except three—the fifth, sixth and seventh—which respectively embrace Charcot's productions in the field of diseases of the lungs and vascular apparatus, diseases of the liver and kidneys, and diseases of the aged, gout and rheumatism. They form an imposing monument of the life-work of this industrious man, and in their present shape the papers, properly collected and arranged, form an indispensable source of reference.

F. X. D.

Turanians. The Hebrew, Greek and Latin literatures are searched to prove the wonderful sameness of human weakness and gullibility through all the ages. Truly a wonderful book—fascinating and instructive. "One touch of nature makes the whole world kin." Dr. Regnier has given this touch, with grace and learning, to a subject which was quite worn out until reanimated by the magnetism of his pen.

The book is evidently inspired, however, by a preconceived idea. The author is an advocate and uses his stores of learning sometimes in the manner of a special pleader. For him hypnotism did not exist in the past. It is a modern product, almost as much as the steam-engine or the telegraph. He finds little, if any, evidence of hypnotism in the religious ecstasy of the ancient fakirs, the impostures of the magi, the serpent-worship of the Egyptians and the hysterical contortions of the Grecian pythoness on her tripod. To establish his thesis he gives minute and interesting details of the various usages and rites of these different mystic sects, and accompanies his narrative with penetrating and instructive criticism. He is more bent, however, upon making distinctions than upon finding analogies. It is here, perhaps, that the philosophic student of hypnotism will take issue with him. He defines hypnotism as a special state of the nervous system, artificially produced, the characteristic of which is a complete or partial unconsciousness, with total forgetfulness of all that transpires during its continuance. This artificial sleep was not known until after Puysegur, and was first described by the Englishman, Braid.

It is not for us to combat here the author's views. Far from it, we agree with him that hypnotism is quite a modern cult, and nowhere so much at home as in his own France. There the practice has been made perfect; the ritual is complete. We nevertheless think, in the author's own concise words: "L'humanité, depuis que nous la connaissons par l'histoire, n'a guère changé." Man has not changed—and the essential facts of hypnotism were in him at the beginning. Only this has happened—a new method is in vogue: the fakir and the pythoness have given place to the trained *comédienne* of the modern hypnotic séance. The induced sleep is no sleep at all, but only the inhibition of a weaker brain by the suggestion of a stronger one, and the adjuncts of time and place. This *suggestion* is the vital fact in hypnotism, and not, as Dr. Regnier would have us believe, the artificial sleep. From our point of view we can see very many striking analogies between the modern practice and the mystic rites which the author describes. From the time when Moses elevated on a pole the brazen serpent in the wilderness; or when the ancient Egyptians cast a spell over the faithful with the cabalistic triangles; or when the Hindoo seer went into an ecstasy with gazing on his own navel, down to the recent day when an aged priest in Pennsylvania cured by faith the credulous and devout—humanity has changed but little.

Hence Dr. Regnier's book may raise an issue in the minds of some students; who will not fail, however, to accord to it the high praise which its historic value and literary excellence abundantly deserve. The book contains many illustrations, some of them quaint, and many of them unknown to us before. It has also a very long and useful list of references.

J. H. L.

stances are not well borne, or when it is desirable to remove the application frequently with water. Combined with oil of cade 25 parts, *sapo viridis* 15 parts, and glycerite of starch 60 parts, it makes a most valuable application in psoriasis, which can be well rubbed in at night and washed off completely in the morning.

The *oleum theobromæ* is ordinarily but little used in compounding ointments. It is particularly useful when added, in about a quarter part, to ointments for use on the hairy scalp, to give them a low melting-point and to aid in forming a protective coating over the skin; when employed in too large a proportion it will prove irritating to many skins.

Under the head of "ointments" we find but two preparations in the Pharmacopœia—the *unguentum simplex*, composed of lard 80 parts and yellow wax 20 parts, and the *unguentum aquæ rosæ*, of expressed almond oil 50 parts, spermaceti 10, white wax 10, and rose-water 30 parts. The *unguentum simplex* is a good combination—much better for general use than simple lard; but, on the other hand, it is often found to be too hard, and ointments made with it will often be difficult of application, and when made up for some time with other ingredients, will become too stiff for ready use; as ordinarily kept in drug-stores it has not infrequently been found quite rancid.

The best ointment of all, when fresh and properly made, is the *unguentum aquæ rosæ*, the cold-cream of the Pharmacopœia. But some judgment and skill is necessary in its preparation, for unless very perfectly compounded, with prolonged rubbing together of the ingredients, the ointment will not be perfect; in summer, also, it will require rather a larger proportion of the spermaceti and white wax in order to have the proper consistency for a perfect application. Very frequently, when the skin tends to be too dry, a portion of the water may be replaced by glycerin. Occasionally the odor of the rose-water is not agreeable to the patient, and simple distilled water may be used in its place. The water held in this ointment is undoubtedly an important element in its remarkable effects on the skin, for the *ceratum cetacci* and *unguentum cetacci* have quite a similar composition, but are by no means agreeable to most skins.

When the various products of petroleum, known in the Pharmacopœia by the general name of *petrolatum*, were introduced, it was thought they would furnish the best possible bases for ointments, and that they would rapidly supersede all other excipients; in Dr. Bulkley's opinion they will never supplant those already mentioned and others of recognized value. They are by no means always agreeable and non-irritating to the skin; indeed, many individuals are found who cannot bear them on the skin at all. Most of them have not body enough to form good ointments, although for simple inunction, as a lubricant, or for the application of carbolic acid to the skin as an antipruritic, vaseline serves the purpose very well.

Recently, when lanolin, and subsequently agguine, were presented to the profession, it was expected that this substance would replace other ingredients as an excipient for ointments. But again we have been disappointed, and lanolin forms but a very small portion of the base of ointments used by those especially occupied with diseases of the skin. It is too sticky and not easy of application, and, moreover, it will often prove irritating to a delicate skin. While it was thought to afford a means for the more ready absorption

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF
FRANCIS H. WILLIAMS, M.D.,
ASSISTANT PROFESSOR OF THERAPEUTICS IN HARVARD UNIVERSITY.

ON THE PREPARATION AND USE OF OINTMENTS IN DISEASES OF THE SKIN.

DR. L. DUNCAN BULKLEY has published a practical and suggestive article on the above subject and gives many hints of value to practitioners. The application of ointments constitutes such a large element in the treatment of diseases of the skin, by the profession at large, that it seems desirable to present a few words of caution concerning their preparation and employment, for want of success often results from the improper compounding or application of one or another of this class of remedies.

It is better not to trust to any artificial means for preserving the freshness of ointments, but to secure sweet and good material and always to reject that which is at all old, or ointments which have been long prepared. It is important to avoid the slightest rancidity in ointments, and it is better to order ointments to be freshly compounded of the strength desired, rather than to take those officinally prepared and kept in stock.

Among cerates, which are in some respects more valuable for ointments for most skin affections than lard, we have two, *ceratum simplex*, consisting of white wax 30 parts, lard 70 parts; *ceratum cetacei*, which is composed of spermaceti 10 parts, white wax 35 parts, and olive oil 55 parts. To these should be added *unguentum cetacei*, which is very like the latter, only somewhat softer. These all have considerable body, and when spread on the skin form a protective coating, more suitable for many conditions than lard alone; but the first mentioned, or simple cerate, is far too hard for easy application in most diseases of the skin. The *glyceritum amyli*, composed of starch 10 parts and glycerin 90 parts, is a good basis for ointments when fatty sub-

There are four ointments containing sulphur, only one of which, the *unguentum sulphuris*, containing 30 per cent. of sublimed sulphur, is well known or much used. This is also too strong for direct application to most skins; diluted two or three times with a little storax, and perhaps a little tar ointment, it forms an excellent treatment for scabies, although the more agreeable applications of naphthol and resorcin have largely taken its place in dermatological practice.

The oxide of zinc ointment of our Pharmacopœia is a fairly good preparation. It is made with benzoinated lard, which is not agreeable to all skins; it is sometimes rancid and irritating in cases in which a freshly prepared zinc ointment in cold-cream is grateful and healing.

Diachylon ointment, when freshly and properly made, is one of the most valuable means of local therapy known for many diseases of the skin. The preparation made according to the original formula of Hebra, and given in the German Pharmacopœia, is a soft, buttery ointment, easily spread, and of a delightfully soothing character to most skins, and is decidedly superior to the ointment made according to the U. S. Pharmacopœia.

A few words may now be added in regard to the actual preparation or compounding of ointments, a feature which continually requires the attention of the physician, if he would have success in the treatment of skin diseases. It is desirable for the physician to frequently inspect the ointments or other preparations which are being employed, and to test them by smelling, feeling, rubbing on the skin, etc.

More harm is commonly done by too strong ointments than is usually supposed. The skin is a sensitive and irritable organ, and more often wants to be treated considerably and soothed into good action than it does to be stimulated and irritated. It is well to begin with a mild preparation, increasing the strength as circumstances seem to demand.

It is also well to remember that the average patient, who has not heretofore been instructed, or who has not had special experience, knows nothing in regard to the best mode of application of an ointment, and if the highest degree of success is to attend the use of any particular remedy, it must be only by its proper employment. Careful directions should, therefore, always be given to patients exactly how to apply ointments.

Where it is desired to keep a part continually under the effect of an ointment, it should be soaked in it, if it were possible, as completely as though the part were immersed in a very large mass of the same; but as this is not possible, we have recourse to lint, and the ointment, which should always have considerable body, is spread to a very thick layer on the woolly side of the lint, and then firmly bound on the part.

An excellent illustration of the necessity for minute directions in regard to all these data is found in connection with eczema of the scrotum. When treated carelessly, or when the patient merely smears on an ointment, the disease will prove most distressing and rebellious; but when, on the other hand, very minute directions are given in regard to the sudden and brief application of hot water once daily, at bedtime, and when the part is quickly dried and enclosed in a piece of lint spread with the tar and zinc ointment previously alluded to, and covered by a suspensory bandage, the patient has

of medicaments, more experience has shown it to be questionable if this is the case. Indeed, in some experiments by Brooke, it was shown that the substances incorporated with lanolin were the slowest in entering the system. Lanolin, is, however, useful as an addition to certain ointments, in the proportion of about 20 per cent., to give an adhesive quality to them, thus securing a firmer and more adherent coating for affected parts.

Of some forty official ointments, very few can be prescribed as they are with advantage in diseases of the skin. Thus the carbolic ointment is made of a strength of 10 per cent., which is far too strong for most skins; whereas the tannin ointment of the same strength is too weak to be of real service. The belladonna ointment is also of the same strength, and is capable, if used at all freely, of producing serious constitutional effects. Also, the official ointment of chrysarobin should be diluted for most skins.

Eight ointments are official containing preparations of mercury. Of these the blue ointment, containing 50 per cent. of metallic mercury, is well known and of great value; but for inunction on most skins it requires dilution by one-half, in order not to excite too much local irritation. White precipitate ointment has commonly to be diluted two or three times, even in psoriasis and seborrhœic eczema. The red iodide ointment is of fair strength, but to be effective in lupus, or where its corrosive power is required, it should be employed much stronger. Citrine ointment, one of the best known of the mercurial applications, is far too strong to be freely used. When diluted two to four times, it often serves a good purpose in reducing infiltrations of the skin. The yellow and the red oxide of mercury require to be very greatly diluted for use about the eyes.

The single ointment of iodine is a good preparation, containing a trifle of iodide of potassium. A prescription which is of great service in reducing glandular enlargements in syphilis, is a mixture of iodine ointment with the ordinary mercurial ointment in equal parts. When well rubbed together an ointment of the green iodide of mercury is made, which acts much more quickly than either of the ointments alone. For delicate skins it may require some dilution, but generally it is well borne. It is useful as a parasiticide in ringworm and favus of the scalp.

The *unguentum picis liquidæ* is an excellent remedy, composed of equal parts of tar and suet; but it is far too strong for general use undiluted. When combined with oxide of zinc and rose ointment it forms one of the most perfect applications known for a large share of cases of subacute eczema, both in children and in adults:

R.—Ung. picis	5ij.
Ung. zinci oxidi	3ss.
Ung. aquæ rosæ	3iv.—M.

The ointments of the carbonate of lead and iodide of lead, each 10 per cent., are also good combinations.

The latter is certainly an excellent means for causing absorption of enlarged strumous glands. The stramonium ointment, containing 10 per cent. of the extract of stramonium, is likewise a good application, and forms a most valuable base for combination with acetate of lead and opium in the treatment of hæmorrhoids.

when the treatment was begun evidences of bronchitis were present, now the chest is clear, and the child able to be taken out of doors daily. All this improvement was brought about in less than ten days. In cases where convulsions and other complications were fast reducing all chances of recovery, its use was attended with perfect success within a few days. In adults, where pertussis assumes often serious aspects, benzole has proved equally efficacious. Two minims in mucilage are sufficient for a child six months old, and five minims in mucilage on sugar or in capsule, for adults. Whenever the benzole odor is observed in the breath of the patient, then all anxiety as to the result may be allayed.—*Lancet*, vol. ii., No. 6, 1891.

ANTIPYRINE AS A HÆMOSTATIC.

PROFESSOR G. CESARI, of Modena, finds that antipyrine applied to an injured bloodvessel or to living tissues, whether in the form of fine powder or watery solution, does not irritate or dry or produce any caustic effect on the tissues or cause pain. It gives rise to local anæmia more or less marked according to the length of time the agent is applied. A fifty to one hundred per cent. watery solution produces no change in the calibre of the capillaries; but made to bathe the veins of the mesentery of a frog, or the jugular or femoral vein of a rabbit, more or less perceptible narrowing of these vessels can be observed. When applied in solutions containing at least fifty per cent. of antipyrine, or in the form of powder, in both cases the application should be made on plugs of cotton-wool; it arrests hæmorrhage more or less speedily.

Antipyrine, if placed in contact with blood at its normal temperature, thickens and condenses it, and, without causing coagulation, prevents it from escaping from the vessels. It stops secondary hæmorrhage.—*British Medical Journal*, 1891.

REMOVAL OF SUPERFLUOUS HAIR.

DR. E. O. LEBERMAN offers the following formulæ, which, in his hands, have proved quite successful. (This formula is recommended by McCall Anderson):

R.—Barii sulphidi ʒiss.
Zinci oxidi ʒvj.

Mix with sufficient water to form a paste, apply for three minutes, and then wash off.

For the removal of stiff, coarse hair, the formula of Neumann is serviceable:

R.—Calc. hydrat. ʒiss.
Orpiment. ʒiij.
Amyli ʒj.
Aq. calcis q. s.

Ft. pasta.

The paste should be spread over the parts from which the hair is to be removed as thick as the blade of a knife. The softened hairs should be scraped from the skin with a dull knife or ivory spatula, the parts washed

complete relief, and with proper accompanying treatment can surely be cured, and that with reasonable speed.

The demand in dermatology is not so much for new drugs, applications, or methods of treatment, as it is for the diffused knowledge of what is already known to be of service, and the faithful carrying out of methods which experience and observation have proved to be useful.—*Therapeutic Gazette*, August 15, 1891.

THE TOXICITY OF SALOL.

Although salol has been very freely used, both among children and among adults, and although it has come to be regarded as one of the least dangerous of the new remedies having antiseptic and antithermic properties, there are not wanting clinical testimonies which tend to show that, under certain circumstances at least, its use may be attended with a fatal result. Two cases of fatal result attending its use have been reported, one in which a fifteen-grain dose of salol was used. In this latter case the patient was suffering from severe gastric symptoms, and was under examination according to Ewald's method. After taking the dose the patient became restless and unconscious, the pupils were dilated, the pulse was irregular, there was constant vomiting, and the urine became dark and contained salicylic acid. Death occurred twelve days later. At the autopsy there were found gastritis and hemorrhagic enteritis, a gastric ulcer cicatrized at the cardiac end, chronic endometritis, and a cyst of the ovary. No doubt was entertained that the salol had been the cause of the symptoms of poisoning.

NAPHTHALINE AS A VERMIFUGE.

DR. MIROVITCH, in the *Mercure Medical*, speaks of naphthaline as the best agent for expelling tænia. In his opinion it is superior to all other remedies, because of the certainty of its action and the absence of all toxic effect, for it is absorbed in but very minute amount by the gastro-intestinal mucous membrane. The dose for adults is fifteen grains, given when the stomach is empty and followed immediately by two tablespoonfuls of castor oil. Children may take from four to eight grains, and at the same time a tablespoonful of castor oil, flavored with a few drops of essence of bergamot. During the two days preceding the administration of the drug the patient is to eat freely of salted, acid, and spiced foods. In all of the cases one dose of naphthaline was sufficient to expel the tapeworm, the head included, even in cases in which other drugs had failed. He has also found the drug most effective in the treatment of patients with ascarides.

USE OF PURE BENZOLE IN WHOOPING-COUGH.

DR. W. ROBERTSON, after some years' experience with the use of benzole in whooping-cough, is satisfied that it effects better results than all the other remedies recognized as useful in this affection. In adult and child it is of equal benefit. In an infant just now under treatment the attacks have been reduced from twenty or thirty in the night to two or three, and whereas

liferates in the epidermic structures only, requiring probably a condition of the skin suitable for its reception and development. All predisposing factors—"pre-existing improvements of the nutrient base"—hitherto so called, bear upon the disease only in so far as they bring about changes in the skin favorable to the germ-proliferation. External agencies—the so-called exciting factors—are to be looked upon as "accidental improvements of the nutrient base." In accordance with these ideas Unna defines eczema as "a chronic parasitic catarrh of the skin, with desquamation, itching, and the disposition to respond to irritation by exudation, and well-marked inflammation."

The author states that the local treatment should, therefore, always have in view the destruction of every single germ in the depths of the epidermis.

ELECTROLYSIS IN THE TREATMENT OF LUPUS VULGARIS.

JACKSON has employed electrolysis, somewhat after the method of Gärtner and Lustgarten, in six cases of lupus vulgaris (*Journal of Cutaneous and Genito-urinary Diseases*, November, 1890). The effect while slow was favorable, and in a few instances practically curative. All the cases were of the non-ulcerative type. A metallic electrode of zinc, half an inch in diameter, attached to the negative pole, is placed upon the patch, and the positive electrode (a sponge electrode) is placed indifferently. The strength of current was about seven milliamperes, and it was passed for seven or eight minutes. A crust forms, which falls off in a week or so. An application is made once weekly. After a time the disease has so far disappeared that but a few isolated nodules remain. The needle is now substituted for the metallic plate, using a current of about three milliamperes. The main objection to this method, the writer states, is that it is slow, otherwise it has many advantages.

NOTES ON PILOCARPINE IN DERMATOLOGY.

KLÖTZ gives (*Journal of Cutaneous and Genito-urinary Diseases*, November, 1890) a succinct résumé of the literature of pilocarpine bearing upon its employment in cutaneous disease. According to the investigations of such observers as Simon, Pick, Piffard, and others, this remedy has a positive value in such diseases as prurigo, dermatitis exfoliativa, hyperidrosis pedum, pruritus, ichthyosis, etc. Klotz reports favorable results in two cases of pruritus senilis, from doses of one-eighth to one-twelfth of a grain, t. d., the quantity being gradually reduced. The notes of three cases of eczema, of the papular and squamous type, are also given, showing good effects from the administration of this drug. The author believes that in the light of more recent theories (Unna) of the physiology of the secretion of sweat, the use of pilocarpine in pachydermatous and xerodermatous conditions of the skin has a rational foundation, but as recommended by Pick, it should be given in small doses and be long continued.

THE USE OF THIOL IN SKIN DISEASES.

SCHWIMMER reports (*Wiener klinische Wochenschrift*, No. 18, 1890) favorable results from the external use of thiol in herpes zoster, dermatitis her-

with warm water and afterward thoroughly dried. A bland ointment should then be applied to the reddened surface. The length of time these pastes should remain upon the skin is best determined by the severity of their action. They both cause slight itching, which sensation is followed by an intense burning; when the latter begins the paste had best be removed. The effect of chemical depilatories can scarcely be more than temporary, as their action can extend no deeper than the epidermis; the hair-bulbs remaining, a new growth will soon appear. Great care should be exercised in their application, and their effects should be carefully watched, for sometimes deep and painful ulcerations occur by their incautious use. However, they serve a purpose, and if properly applied will often leave the skin free from hirsute appendages which disfigure it.

FOR CORNS AND WARTS.

A mixture of one part each of lactic acid and salicylic acid in eight parts of collodion is recommended as an excellent application to warts or corns, effecting their removal in a short time.

MENTHOL IN HAY FEVER.

DR. LENNOX WAINWRIGHT has found menthol of great service in hay fever. It acts best when mixed with carbonate of ammonium, and used as smelling-salts. Patients state that all irritability disappears, and in many cases they get no return of the symptoms.—*Medical Record*, vol. xl., No. 9, 1891.

COMMON THYME IN WHOOPING-COUGH.

Common thyme, which was recommended in whooping-cough three or four years ago by Dr. S. B. Johnson, is regarded by Dr. NEOVIUS, who writes a paper on the subject in a Finnish medical journal, as almost worthy of the title of a specific. During an epidemic of whooping-cough he had ample opportunities of observing its effects, and he came to the conclusion that if it is given early and constantly it invariably cuts short the disease in a fortnight, the symptoms generally vanishing in two or three days. They are liable to return if the thyme is not taken regularly for at least two or three weeks. He gives from one ounce and a half to six ounces per diem, combined with a little marshmallow syrup. It may produce a slight diarrhoea. It is important that the drug should be used quite fresh.

HYPODERMATIC INJECTIONS OF STRYCHNINE IN TEN CASES OF CHRONIC ALCOHOLISM.

DR. ERGLOSKI has published an account of ten cases of chronic alcoholism among his patients. They had the habit of taking brandy. They were given subcutaneous injections of nitrate of strychnine, one-sixtieth to one-twentieth of a grain at each injection.

After a dozen injections the results were remarkable, as they all acquired a distaste for brandy. In such cases as are desirous of being cured this treatment may prove to be of assistance.—*Bulletin Général de Thérapeutique*, No. 20, 1891.

MEDICINE.

UNDER THE CHARGE OF

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THE NATURE, ACTION, AND THERAPEUTIC VALUE OF THE ACTIVE PRINCIPLES OF TUBERCULIN.

DR. WILLIAM HUNTER (*British Medical Journal*, 1891, No. 1595) writes that Koch's remedy for tuberculosis is a glycerin extract of pure cultivations of tubercle bacilli.

"The only substance capable of fulfilling, although still with difficulty, all the conditions laid down by Koch for his active principle would, in Hunter's opinion, be one of crystalloidal nature—presumably a toxine. Such a body might (1) be in sufficiently close association with one of proteid nature as to be carried down when the latter was precipitated by absolute alcohol, and yet (2) at the same time sufficiently loosely attached to be dialyzable away. Further, it might (3) be able to resist the action of high temperature without losing its poisonous properties. On the other hand, a protein substance which would readily fulfil the first and third conditions could not possibly fulfil the intermediate one of dialyzing easily through the parchment membrane. And, lastly, a poisonous peptone which could fulfil the condition as regards precipitation by alcohol, and might also fulfil the one as regards easy diffusibility, could with difficulty fulfil the third one of being unaffected by heat."

Hunter's observations, commenced in January of the present year, have had for their object:

1. To isolate the constituents of tuberculin, and to determine their chemical nature.
2. To ascertain their action with special reference to their power of inducing the two most characteristic effects of tuberculin—namely, local inflammation and fever.
3. To ascertain how far it was possible to eliminate all substances having an injurious action, and thus to obtain its remedial, without any of its injurious, effects.

"SUMMARY OF RESULTS.—In their order of importance, as well as of amount, the chief substances present in tuberculin are, according to these observations:

"1. Albumoses; chiefly proto-albumose and deutero-albumose, along with hetero-albumose, and occasionally a trace of dysalbumose.

"2. Alkaloidal substances; two of which can be obtained in the form of the platinum compounds of their hydrochlorate salts.

"3. Extractives; small in quantity, and of unrecognized nature.

"4. Mucin.

"5. Inorganic salts.

"6. Glycerin and coloring matter.

"So far as the observations go, the following substances are absent from tuberculin, namely, serum-albumin, globulin, peptones."

With the view of ascertaining to which of these bodies or groups of bodies tuberculin owed its characteristic properties, observations were made first on animals—mice and guinea-pigs—and subsequently on tuberculous patients. The following modifications of tuberculin were employed:

Modification A: This contained the total precipitate thrown down from tuberculin by the action of absolute alcohol. The solutions of this precipitate were found to contain every constituent of tuberculin; but the proportion of albumoses was relatively increased, that of salts relatively diminished.

Modification C was the counterpart of A, the salts and other soluble substances being relatively in excess, while the amount of albumose was relatively small.

"The most interesting contrast was afforded by the action of these two modifications, A and C. Both of them had remedial properties, causing absorption and disappearance of tuberculous tissue; but while in the case of A this was attended by decided and occasionally severe local inflammatory reaction, even with small doses, accompanied by comparatively little, sometimes no fever, in the case of C the improvement was attended with no local inflammation, and nevertheless high fever."

Modification B: In this the whole of the albumoses of tuberculin were precipitated by means of ammonium sulphate, so far at least as that was possible without the aid of heat or acetic acid. The precipitate was then taken up in distilled water and dialyzed.

"The solution thus prepared was found to possess in an eminent degree the power of inducing local reaction, followed by healing change around tuberculous lesions, unaccompanied by any constitutional disturbance whatever."

A fourth modification, C B, prepared from C, yielded a solution which gave all the reactions characteristic of albumoses (the salts having been separated by dialysis) and proved to be capable of inducing very distinct local improvement, unattended with fever (in most cases) and still more markedly accompanied by scarcely noticeable inflammatory reaction.

Dr. Hunter summarizes his conclusions as follows:

"1. Tuberculin owes its activity not to one principle, but to at least three, and probably more, different substances.

"2. Its action in producing local inflammation, fever, and general constitutional disturbance is not a simple but an extremely complex one.

"3. Its active ingredients are of the nature of albumoses, alkaloidal sub-

stances, and extractives. The action of these is in certain instances antagonistic.

"4. Its remedial and inflammatory actions are connected with the presence of certain of its albumoses, while its fever-producing properties are chiefly associated with substances of non-albuminous nature.

"5. The albumoses are not lost by dialysis, the latter are. By the adoption of suitable methods it is thus possible to remove the substances which cause the fever, while retaining those which are beneficial in their action.

"6. The fever produced by tuberculin is thus absolutely unessential to its remedial action.

"7. The same holds true, I would fain believe, with regard to the inflammation produced by it. Inflammation is certainly not absolutely necessary for the manifestation of its remedial action. It is in some cases, however, beneficial, and helps, under certain circumstances, the action of the remedial substance.

"8. The difference between the substance which causes the inflammation and the one which possesses the remedial properties as regards their action is not merely one of degree. The local reaction which occurs with small doses of the former is much greater than that producible by large doses of the latter.

"9. Nevertheless the remedial substance has as truly a local action as the one which tends to produce inflammation. This is evidenced in two ways—first, by distinct and obvious shrinking of the tuberculous tissues; and, secondly, increased scaling, pointing to the existence of a certain amount of deep local congestion. In some cases this congestion becomes obvious by slight superficial reddening.

"10. The power of favoring recurrence, which tuberculin possesses, is connected partly with the non-albuminous substances removable by dialysis, possibly also with a portion of the albumoses present.

"11. The remedial substance resists the action of high temperatures. Its action is, however, lessened if exposed to a temperature above 70° C. in a dry condition. Its properties, moreover, can be altered in other ways, sometimes, for example, materially by dialysis. This change is not due to the passage of the substance through the membrane, but to changes occurring in it within the dialyzator. Its sensitiveness in this respect I regard as one of its chief features, and causes its preparation to be attended with special difficulties.

"12. Both it and the albumoses present probably belong to the class of proteins—albuminous substances derived from the plasma of the bacilli themselves, and not merely formed by the action of these bacilli on the surrounding tissues."

As regards the therapeutic value of the above modifications of tuberculin, Dr. Hunter speaks in very guarded terms.

To justify the claim to be classed as a remedial agent, every substance must fulfil the following simple requirements: 1. Its action must in a suitable proportion of cases be beneficial. 2. In competent hands its action must not at the time produce any immediate ill effects. 3. Its action must not be followed by remote ill consequences directly traceable to it, still less by consequences which may endanger the life of the patient.

Judged by this standard, tuberculin cannot be regarded a safe remedy, and any modification of tuberculin must be subjected to the same test and

fulfil the same requirements before it can be regarded as a safe remedial agent.

Modification A and modification C are not recommended for use.

Modification C B fulfils the first condition, and so far also the second. It contains the remedial agent present in C without the fever-producing qualities of the latter. The absence of local reaction other than a very slight reddening gives it great advantages if it be employed for internal tuberculosis.

Modification B contains the remedial properties of C B, with the additional property of inducing local inflammation. It fulfils the first condition, and so far the second, with the exception of producing local reaction. The crucial condition to be fulfilled is, however, the third, and time alone can decide this.

The author is of opinion that the action of the various substances has been materially intensified by the process of purification.

OSTEOMALACIA IN INSANE PATIENTS.

DR. DAVID WALSH (*Lancet*, 1891, No. 3543) records four cases occurring among a population of 1300 women in Wakefield Asylum. A post-mortem examination was made in three cases, the fourth was still living. One woman had borne "several," another three, the third two, whilst the fourth was childless. The average age at which the disease was first noted was sixty-eight. (Cf. the conclusions arrived at by Durham in Heath's *Dictionary of Surgery* from the analysis of 145 collected cases, "that the great majority began to suffer between twenty-five and thirty-five years of age.")

In three of the author's cases chronic rheumatism was suspected; in three fractures took place from trifling causes, and though not absolutely proved, fracture was probably present in the fourth.

In all four cases there was aortic valvular disease.

One of the patients showed epilepsy of many years' duration, winding up with a rapid final development of osteomalacia and of phthisis.

The life history of the patient who is still alive is remarkable. Springing from a mentally affected family, she first came under treatment for delusional insanity at the age of sixty-six, and was readmitted at seventy for a similar complaint. An aortic murmur was noted at seventy-one, and fractured hip occurred one year later with well-marked osteomalacia at seventy-five, and, lastly, a scirrhus of the mamma at seventy-nine.

The author lays especial stress on the advanced age, absence of frequent child-bearing, and the coincidence of aortic disease with recurrent attacks of delusional insanity.

LOCAL MILIARY TUBERCULOSIS IN THE COURSE OF TREATMENT WITH TUBERCULIN.

TANGL (*Deutsche medicin. Wochenschr.*, 1891, No. 19) reports the fatal case of a man, twenty-five years old, admitted to the wards of A. Fränkel, in the Berlin Urban City Hospital, with pulmonary and laryngeal tuberculosis, in whom, in the course of treatment with tuberculin, tuberculosis of the tongue developed. The case had been demonstrated by Fränkel to the Berlin Medical Society. When admitted to the hospital the patient presented the evidences of pulmonary and laryngeal tuberculosis of moderate degree,

without excavation, or more than slight superficial ulceration respectively. At the end of six weeks, during which he was treated with injections of menthol, gaining weight, and the disease not progressing, injections of tuberculin were begun. Two weeks later, after 0.1 gramme of tuberculin had been given in fourteen injections, there appeared at the anterior margin of the right side of the tongue, which hitherto had not shown the slightest evidence of involvement, a number of small, whitish vesicles, some of which ruptured, leaving superficial, painful, aphthous ulcers. The tongue now became reddened and indurated; small nodules appeared, while the ulceration extended. In the pus removed from the ulcers tubercle bacilli were found. Subsequently there developed in the right half of the tongue a large mass, at the periphery of which ulceration took place, while in the area beyond the ulceration numerous miliary and submiliary nodules developed. A bit of the callous margin of the ulcer and three nodules were excised for histological examination. A week later numerous new nodules had developed, while some of the older appeared grayish-white. Of the latter, a number were excised for histological examination. In this way the condition of the tongue progressively advanced. Deglutition became difficult, the vital forces rapidly failed, dyspnoea increased, and death ensued three months after the treatment with tuberculin had been begun. Diarrhoea was present during the last three weeks of life, the stools containing tubercle bacilli.

The autopsy was made twelve hours after death. The lungs were extensively involved in the tuberculous process; the left lung contained a cavity as large as a fist, lined with cheesy matter. The larynx was the seat of profound ulceration and advanced perichondritis. The large and small intestine were involved in extensive and profound ulceration. The mesenteric and bronchial glands were enlarged and cheesy. The liver, spleen, and kidneys contained numerous gray, translucent, miliary tubercles. The tongue presented the conditions indicated during life.

The treatment with tuberculin, which was withdrawn eighteen days before death occurred, covered in all seventy-eight days, forty-eight injections, a total of 1.165 grammes being given; the initial dose was 0.001 gramme, the final dose 0.06 gramme. Examination, by approved methods, of the tissues excised clearly demonstrated the tuberculous nature of the ulceration, established that the gray nodules that were constantly forming were true miliary tubercles of recent origin, and failed to disclose any evidence of unusual necrosis or unusual inflammatory small-celled infiltration.

In a discussion of the origin of the tuberculosis of the tongue, two possibilities may be considered: either the bacilli were present in the tongue before the injections were begun, or they were carried thither in the course of the treatment. If the bacilli were primarily present they must have been few in number; they could not have been abundant without giving rise to evident changes. Granting that bacilli were present, it follows that treatment with tuberculin did not prevent their rapid multiplication; on the contrary, the nodules that appeared afresh from time to time could only have been developed as a result of renewed deposition. It is more probable, however, that the bacilli reached the tongue during the course of treatment. This they may have done either through the blood or

lymph, or through the sputum. Unfortunately, the primary ulceration was not examined for tubercle bacilli. It is known that aphthous ulcerations heal notwithstanding the presence of tubercle bacilli in the sputum; while, according to the experiments of Koch, local inoculations in tuberculous animals are not progressive. The actual mode of infection of the tongue cannot therefore be definitely determined. There can be no doubt, however, that the tubercles developed adjacent to the ulceration were of local origin, the largest in size and number being nearest the area of ulceration, around which they were clustered in a corona. The histological examination, in conjunction with the clinical course of the case, makes it apparent that some of the nodules examined could have been but a few days old, having developed in the course of treatment. The conclusion forces itself upon one that in the case reported tuberculin failed both to prevent the development of new tuberculous masses and to exert any curative influence upon the processes that existed.

Tangl disclaims any wish to make general deductions as to the utility of tuberculin. He rather considers the case as one of a number in which, for reasons not yet known, tuberculin fails to exert any beneficial influence. A careful study of such cases may lead to a knowledge of the conditions that interfere with the favorable action of the remedy, or contraindicate its application. At the same time, the cases must not be ignored in which tuberculin undoubtedly exercises a favorable influence.

ALLOCHIRIA.

WEISS (*Prager medicin. Wochenschr.*, 1891, No. 24) reports the case of a woman, fifty-four years old, with a neuropathic heredity, who had for a number of years presented typical symptoms of locomotor ataxia. In addition, the patient was hysterical and a victim of morphinism. Beside the ordinary manifestations of tabes, she presented bilateral ptosis, bilateral temporal hemianopsia, decided salivation, tachycardia, laryngeal and gastric crises, and an excessive (trophonurotic) formation of callus at the seat of an old fracture of the tibia; a tendency to melancholia, an impairment of memory and a pseudo-paralysis of the lower extremities that existed, were ascribed to the hysteria. On testing sensation, it was found that impressions made upon one side of the body were referred to the corresponding point on the opposite side: stroking the skin of the lower extremity, the prick of a needle, the application of a hot sponge and of a bit of ice, the passive fixation of the great toe, of the foot, and of the knee, were all recognized, but referred to the opposite extremity. There thus existed allochiria of tactile sensibility of the pain, of the temperature, and of the muscle-sense.

Weiss considers as plausible Hammond's explanation of the occurrence of allochiria: an obstruction in the cord that diverts a sensory impression made upon one side of the body to the same side of the brain, as a result of which the impression is referred to the opposite side of the body: The disappearance of the symptom that commonly occurs may depend upon structural removal of the sensory obstruction. Weiss believes that the phenomenon would be more commonly encountered if careful sensory examinations were habitually made.

ALBUMINATURIA.

In a communication presented to the Société de Biologie, GAUBE (*La Médecine Moderne*, 1881, No. 23) described as albuminaturia a condition characterized by the presence in the urine of a small quantity of albumin in association with carbonates, or especially with earthy phosphates. Albuminaturia may be physiological, pathological, or experimental. Physiological albuminaturia is transitory; it accompanies pregnancy; in both sexes it follows coitus; in the female it follows menstruation. Pathological albuminaturia is protracted in duration and of grave prognosis; it appears in the course of extensive suppuration, or associated with changes in the nervous system. Experimental albuminaturia is a result of the stomachal ingestion of an excess of phosphates soluble in the urine, of which the excess is eliminated as albumino-phosphates. Calcic albumino-phosphate, the most abundant in the urine during the existence of albuminaturia, is a combination of albumin with the bibasic calcium phosphate, and has a rotatory constant of -92° . The urine of albuminaturia is scanty; it contains but a small proportion of urea, of mineral matters, and of phosphoric acid; it is scarcely acid; filtered, not acidulated and heated, a precipitate of the bibasic calcium phosphate is thrown down, soluble by the addition of one or two drops of acetic acid; the solution of the precipitate is followed by a cloudiness of the urine, dependent upon precipitation of albumin, insoluble by heat or acids, but soluble in alkalis. Albuminaturia is distinguished from ordinary albuminuria or serumuria, in addition to other physico-chemical characteristics, by the preponderance in the urine of the mineral over the proteid matters; in serumuria proteids predominate over mineral constituents.

DANGER OF BREAKING-DOWN CAPSULES ABOUT COLONIES OF BACILLI.

In an address made before the Medical Society of Hanover, in March, 1890, BRUNN-LIPPSRINGE (*Deutsche med. Wochenschr.*, Jan. 22, 1891) referred to the irregularity of the nasal surfaces, the tortuous course and progressively narrowing lumen of the air-passages, with their ciliated epithelium and constant outward current of mucus, as natural protections against the invasion of infection and the entrance of bacilli into the deeper respiratory passages. In the event of infection taking place, the bacilli passing the pulmonary portals and gaining entrance into the alveoli, where they find the conditions for the development of their activities, the organism makes a final effort to rid itself of the invaders; failing in this, it endeavors to prevent their entrance into the blood. The colony of bacilli is surrounded by a wall of living cells; the latter destroy or isolate the former, cutting off their nutrition and preventing general infection. As a result of mechanical or chemical irritation a connective-tissue capsule is formed. The slow development of the tubercle bacillus accounts for the long period of incubation of tuberculosis, and affords abundant time for the formation of a surrounding capsule. In this way the prolonged localization and the slow extension of the disease find explanation. In the absence of a specific remedy for tuberculosis, the therapeutics must be so directed as to supplement the efforts of Nature, by favoring the development of the protecting capsule, an end best accomplished by

elevating the nutrition, improving the general condition, and regenerating the blood and bodily fluids. If this view be correct, any procedure which causes destruction of the surrounding capsule, with setting free of the bacilli, carries with it the danger of dissemination. This is illustrated in the general infection following operative treatment of tuberculous bone disease and of fistula-in-ano of tuberculous character.

SURGERY.

UNDER THE CHARGE OF

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THE SUPPOSED CURATIVE EFFECT OF OPERATIONS, PER SE.

Under this title, DR. J. WILLIAM WHITE, of Philadelphia, contributes a paper to the *Annals of Surgery* for August, 1891, which, not only from its subject, but from the great number of authorities quoted and from the peculiarly rich experience of the writer, makes an article of unusual interest and importance to both surgeon and physician. The author's attention was first directed to this subject by reason of his experience with the operation of trephining for so-called traumatic epilepsy.

During the past five years, with Dr. D. Hayes Agnew, he has trephined in fifteen cases of supposed traumatic epilepsy. All but one recovered from the operation. The patient who perished was an imbecile and a confirmed drunkard, as well as an epileptic. Death occurred from suppression of urine, probably secondary to etherization.

In one case a bullet was found imbedded in the brain substance; in another an irregular portion of the internal table was dissected out from beneath the dura mater, to which it was attached by cicatricial adhesions. In another there were projecting spicules of bone on the internal surface of the button removed and the adjacent portions of the skull. In two, marked sclerosis and thickening of the cranium were observed about the field of operation. In the remaining cases nothing abnormal was seen. Although this was the case, they were, without exception, markedly improved by trephining, in two instances even to the point of apparent cure, no return of symptoms having been observed for eighteen months and for two years after the operation. In the other seven the results were strikingly favorable, convulsions disappearing for weeks or months, although previously of more than daily occurrence.

The author has, in so far as this is possible, classified the cases in which operation *per se* seemed to be the main factor in bringing about a cure. These cases are divided into three groups, in accordance with the anatomical seat of the symptoms or of the supposed disease. This brings them under the following heads:

1. Operations for the relief of nervous phenomena, as epilepsy, insanity, paralysis, etc.
2. Operations for abdominal and pelvic disorders, as peritonitis, tumors, etc.
3. Miscellaneous operations.

This classification is further carried out by grouping together (*a*) those cases in which nothing whatever was found explanatory of the symptoms; (*b*) those in which some departure from normal conditions was observed, but was so slight as to be apparently inadequate to explain the symptoms; (*c*) those cases in which an apparently grave and irremediable condition was disclosed by an exploratory operation, but notably improved or altogether disappeared after mere inspection and handling, no further surgical interference having been thought justifiable.

Under the heading of "Operations for the Relief of Nervous Phenomena," Dr. White has tabulated, including his own service, 154 cases. Many of these are given in detail, and coming as they do from recognized authorities, are of exceeding great interest.

In 56 cases of trephining for epilepsy nothing abnormal was found to account for the symptoms. Nineteen cases were reported in six months or less after operation; 11 cases were reported from one to two years after operation; 1 was reported eight years after operation.

Of these cases 25 were reported as cured; 18 as improved; in 3 it was mentioned that a relapse occurred later.

In 30 cases of ligation of bloodvessels for epilepsy 14 were reported as cured; 15 as improved; 1 died seven days after operation. In the fatal case the right common carotid artery was tied. No fit occurred after the operation.

In 10 cases of castration for epilepsy all were reported as cured. One case was reported four months after operation; 4 cases were reported more than two years after operation; in 5 the time when reported is not mentioned.

In 9 cases of tracheotomy for epilepsy 2 were reported as cured; 6 as improved; 1 as much improved, though death in this case followed in two months after the operation.

In 24 cases of removal of the superior cervical ganglia of the sympathetic nerves 6 remained well at the end of three years; 10 were improved; 5 remained unimproved; 2 died soon after the operation, but not from its direct effect.

In 6 cases of incision of the scalp for epilepsy nothing was found to account for the symptoms. Three of these cases were reported as cured at the end of one year; 2 were reported as cured at the end of two years; 2 other cases, almost similar, were reported as cured.

Twelve cases of epilepsy are reported as cured by such operations as stretching of the sciatic nerve, excision of the musculo-cutaneous nerve, cauterization of the larynx, circumcision, application of a seton to the back of the neck,

petiformis, erythema multiforme, papular eczema, etc. Reference is made to an unusually rebellious case of dermatitis herpetiformis, which responded rapidly to applications of a lotion of thiol (1:3); the lotion was painted over the affected parts twice daily for several days, and then the skin washed with water. The vesicles and bullæ disappeared, leaving slight pigmentation. Powdered thiol (thiolum siccum pulverisatum) seemed preferable in erythema multiforme, whereas in papular eczema the wash was more cleanly and satisfactory. The remedy has the great advantage of absence of disagreeable odor.

OBSTETRICS.

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THE PATHOLOGY OF TUBAL PREGNANCY IN ITS EARLY MONTHS.

ORTHEMAN (*Zeitschrift für Geburtshilfe und Gynäkologie*, Band xx. Heft 1) concludes from the study of ten cases of tubal pregnancy operated upon between the first and second months, that a firmly-organized clot found upon laparotomy in an oviduct is very strong presumptive evidence of the occurrence of tubal gestation. An intra-peritoneal hæmatocele with tubal pregnancy results from rupture of the sac of the embryo, or through an abortion of an ovum situated at the abdominal opening of the tube. The recognition of decidual cells is not absolutely necessary for the diagnosis of a tubal pregnancy. Villi of the chorion can be recognized in all cases of tubal pregnancy during the early months.

PERNICIOUS VOMITING IN PREGNANCY.

FLAISCHLEN (*Ibid.*) reports five cases of pernicious vomiting in pregnancy, of which three perished. In two cases, induced abortion resulted in prompt relief to the patient, while two of the fatal cases were lost in spite of this resource. Fleischlen believes that, as a rule, the uterus is emptied much too late in these cases. He regards a very rapid pulse as the most important indication of danger, and would base his decision regarding the necessity for interference largely upon this symptom.

THE INFLUENCE OF METHODS OF EXAMINATION AND CONDUCTION OF LABOR UPON PUERPERAL MORTALITY.

LEOPOLD and PANTZER (*Archiv für Gynäkologie*, Band xxxviii. Heft 2) have studied the problem of the relation of puerperal mortality with methods of conducting labor and making examinations. It was found that many

of chronic chorea, *petit mal*, and even delusional insanity, the effect of the operation *per se* is in large measure the potent cause of the supposed cure. This belief is founded not alone on theory but upon the fact that in certain cases of reflex nervous troubles a cessation of the symptoms has followed the tenotomy, although this has not produced perfect equilibrium. Again, the relapses which may take place after a perfectly successful series of tenotomies would indicate that the nervous phenomena attributed to the insufficiency, for the relief of which the operations were made, were not correctly so attributed, and that the temporary relief must be ascribed to some cause other than the restoration of an imperfect balance of the external ocular muscles.

In seeking for a reasonable explanation of the phenomena observed in the above cases, the author has formulated the conditions which are common to nearly all of them. These are:

1. Anæsthesia.
2. Psychical influence, or so-called mental impression.
3. Relief of tension.
4. Reflex, action or the "reaction of traumatism."

These influences were operative in the majority of cases, although not one of them, except the last, applies to the whole list.

With the idea that it was conceivable that a disease of the nerve centres not reached by ordinary drugs might be affected by agents of such volatility and diffusibility as ether and chloroform, the author instituted a series of observations upon a number of epileptics in various stages of the disease. All other treatment was withdrawn, ether was given to the production of full anæsthesia at intervals of from forty-eight to seventy-two hours. The results were either entirely negative, or in consequence of the withdrawal of their bromides the patients grew worse.

Since in the great majority of cases upon which Dr. White bases his paper there were either undoubted symptoms, such as are habitually associated with organic disease, or there was demonstrable and unmistakable evidence of such disease, it is necessary to believe, in considering the psychical influence of operation, that powerful impressions acting upon the emotional or intellectual nature may affect the organic processes of secretion, nutrition, etc., and may arrest pathological changes and bring about reparative or recuperative action. Cases are cited in which such influences are clearly set forth.

The author holds that the normal equilibrium which we witness between the cerebro-spinal and the sympathetic systems as respects their influence upon the bloodvessels is obviously more or less interfered with when the brain transmits a more than wonted impulse, allowing the unrestrained action or paralyzing the influence of the sympathetic vasomotor nerve. In this relation the author narrates some remarkable cases of hypnotism, and quotes some striking examples of the influence of the central nervous system upon the body.

Belief is expressed that in many of the cases described there can be little doubt that relief of tension is an important factor in amelioration or cure. If it is assumed that preternatural tension exists in the cranial cavity, this would be relieved to an extent by trephining, and there would be but few exceptions to the rule, that in each case something was done which lessened tension in

tenotomy of the external recti muscles, burning of the scalp, puncture of the heart, etc.

Thirteen cases of spontaneous or accidental cures of epilepsy are also reported, at a time varying from two months to five years after the traumatism, which was a fall, a burn, a wound, an amputation for intercurrent injury or disease, etc.

Passing from the cerebral to the spinal region, Dr. White cites an illustrative case of his own. A man aged fifty-five years was attacked on December 25, 1887, with severe pains in his arms and shoulders. A few days later there was weakness of the thighs, spreading rapidly down the legs to the feet, and upward on the body to the nipple line. In eight days there was absolute paralysis of the parts involved, including both sphincters, while at the same time the paralyzed parts became the seat of profound anæsthesia. Girdle pains developed, bedsores made their appearance, percussion of the spine over the third and fourth vertebræ became painful. The reflexes were exaggerated, and light blows on the head in the direction of the spinal axis gave rise to frightful exacerbations of the girdle pains. In spite of every remedial measure these symptoms increased in severity for ten months. An exploratory operation was then undertaken. Dr. White removed the spines and laminæ of the first five dorsal vertebræ, opened the slightly thickened dura, separated some firm adhesions to the subjacent pia mater, explored the cord, and having failed to discover any serious pathological changes, closed the wounds in the dura and soft parts.

The girdle pains had entirely disappeared by the following day, sensation began to return in the feet the day after, voluntary motion in the toes after the eighth day, and so one symptom after another disappeared until the patient completely recovered, and is now earning his living by manual labor.

In the list of abdominal and pelvic disorders apparently cured by operation *per se* a number of extraordinary cases are cited. The experience of Tait, who has more than once drawn attention to the astonishing disappearance of tumors, often of large size, after a mere exploratory incision, and the corroborative testimony of Von Mosetig, are cited at length. Koenig's analysis of 131 cases of tubercular peritonitis treated by abdominal incision is carefully discussed.

In response to letters of inquiry upon the subject, Dr. White received many communications from prominent operators, the great majority of them containing notes of cases not previously published.

Among the signers of these letters are to be found the names of Goodell, Hirst, Battey, Roswell Park, Lusk, Cheever, Chas. T. Parkes, Cabot, Hunter McGuire, Nancrede, Weir, Stimson, and many others of equal note.

Under the heading of Miscellaneous Operations the author has given several of very diverse character.

First are quoted cases of osteomalacia, cured, after weeks or months of confinement in bed, by either oöphorectomy or Cæsarean section.

Passing to another subject, the question of graduated tenotomy of the eye muscles for the relief of severe nervous symptoms is carefully discussed. The author freely acknowledges the value of tenotomies, both complete and graduated, in the restoration of equilibrium in badly balanced ocular muscles, but he is none the less convinced that in numbers of instances of reported cures

4. The theory of accident or coincidence scarcely explains the facts satisfactorily.

DEEP URETHRAL MEDICATION IN THE TREATMENT OF URETHRAL CATARRH.

Some practical suggestions for deep urethral medication in the treatment of posterior urethral catarrh are made by KEYES (*Medical Record*, vol. xv., No. 4), whose position as a genito-urinary surgeon is such as to entitle any of his writings to careful consideration.

He again calls attention to the fact that it is impossible to say exactly what a stricture is, since every natural undulation of the canal may be so classed by the physician who is properly impregnated with the large-calibre-stricture idea, and hence he is sure to find what he looks for in every case of gleet.

Keyes states that the vast majority of chronic gleet cases have already been cut anteriorly in the urethra from one to eleven times, and that very few of them have been tested to ascertain whether they have posterior urethritis or not. He states that one may easily learn how to cure many, and diagnose all, cases. Where the trouble is due to anterior urethral catarrh, caused by stricture, granulations, or what not, the source of the pus may be demonstrated without the endoscope by gentle, thorough, hot irrigation of the anterior urethra by means of a soft catheter passed into the sinus of the bulb, and the immediate subsequent use of the simple metallic bulbous bougie, provided the meatus be reasonably large; for if the pus comes from granular or strictured portions of the pendulous urethra, the irrigation will only wash away what lies loose in the canal, and the bulb will subsequently bring forth upon its shoulder soft muco-purulent clots, generally tinged with blood, which have been scraped off the excoriated areas from around which the inflamed mucous membrane secretes whatever free pus exists. There may be tight areas, which the bulb will detect; but if there be not a granulating surface upon the tight area or behind it, which the bloody muco-purulent clots on the shoulder of the bulb will demonstrate, or their absence disprove, then the cutting of such tight areas will not favorably modify gleet in most instances. Even though there may be some tight areas and a moderate condition of granulation, if there is also posterior urethritis the cutting of the tight areas, although it may greatly moderate, will not cure the gleet, and this should be told a patient before such operation is undertaken.

When there is posterior urethritis the quantity of pus lying in the urethra behind the bulbo-membranous junction is disproportionately great when compared with the amount of gleety discharge that appears at the meatus. This may be readily demonstrated. If the urethra be milked by firm pressure with the finger, from the perineum forward, until all the pus that will come be squeezed out, and then the patient be instructed to urinate in two parts, into separate glasses, if he have even moderate posterior urethritis the quantity of pus mixed with the first urinary gush, representing the washing out of the deep urethra, will be disproportionately great when compared with what has flowed out spontaneously from the meatus or been milked out by the physician before the urinary act, as shown by gross inspection of the specimen. And if the grade of posterior urethritis be intense, not only will the first

the cavity or organ of the body. There are other cases, however, in which no such relief was obtained, and yet cure resulted from operation. A diminution of the tension would manifestly alter the blood-supply to any important organ in the body, and with it the nutritive processes, local and general. Beyond this nothing definite can be said except as it applies to cases of ascites, in which, as in cases of hydrarthrosis, one tapping may prove permanently curative because the original source of irritation and hypersecretion has already disappeared.

Under the head of Reflex Action, the author includes the "reaction of traumatism," as well as the effects of revulsion and counter-irritation.

Verneuil has long since shown that very slight traumatism sometimes excites in the entire economy a general perturbation, and sometimes, by selection of the weak point, a sudden aggravation of lesions that are only slight or have slumbered. This same excitement, usually prejudicial, may occasionally be curative. In the case of spinal surgery above detailed, Dr. White believes that the local shock of the operation was promptly followed by a corresponding reaction in which the vitality of the tissues was raised sufficiently high to determine a return to the normal state. In this relation the reciprocal influence of one portion of the body on another is briefly discussed.

In considering abdominal tumors, attention is called to the possibility of the spontaneous disappearance of such tumors, the relation of this disappearance to the operation being coincidental; cases are cited in point. As to the cure or amelioration of growths thought to be malignant by merely exploratory operation, a long search through the literature of the subject has met with but little success.

The cure of tuberculosis of the peritoneum as the result of exploratory incision is explained on the ground that the removal of ascitic fluid allows the peritoneal surfaces to fall together and to acquire adhesions. The tubercles are then shut in between the coils of intestine, the omentum, and the abdominal wall. They are thus surrounded by tissues in a high degree of activity, which can now throw around them the limiting zone of young cells and eventually fibrous tissue, which, if the tuberculous process is not too far advanced, may effectually resist it and may cause it to retrograde, the process being analogous to that which we see imperfectly going on around a cancerous growth.

As a result of a study of the subject, the author believes the following conclusions are warranted:

1. There are large numbers of cases of different grades of severity and varying character which seem to be benefited by operation alone, some of them by almost any operation.

2. These cases include chiefly epilepsy, certain abdominal tumors, and peritoneal effusions and tubercle, though the improvement in the latter is, perhaps, to be explained on general principles.

3. Of the possible factors which, by reason of their constancy, must be considered, anæsthesia seems least likely to have been effective. The other three—viz., psychical influence, relief of tension, and reflex action—may enter in varying degrees into the therapeutics of these cases, and taken together, serve to render the occurrence of occasional cures less mysterious.

the injection may be made before the patient urinates; when the inflammation extends further backward, and the supply of pus is considerable, the patient should urinate just before making the injection, so that the fluid will flow into the bladder and become thoroughly applied to the mucous membrane at the internal prostatic urethral orifice, without being diluted or neutralized by coming in contact with urine in the bladder at this point.

In suitable cases the free pus disappears from the second urinary flow, then it disappears entirely from the urine, some shreds still remaining. These are attacked by increasing the strength of the injected fluid, or if there be some stricture in the membranous urethra by the use of sounds, after the catarrhal surface has been modified by the previous employment of injections, combined often with anterior astringent injections, which the patient himself administers.

After an extensive use of the various remedies which have the repute of controlling the flow of pus from mucous membranes, Keyes relies almost exclusively upon four substances—sulphate of thallin, sulphate of copper, glycerole of tannin, and nitrate of silver.

The sulphate of thallin is bland and practically unirritating, and may be used up to a saturated solution, which is about twenty-four per cent. It is suitable in all the acuter forms of inflammation (except cases of acute frank, recent gonorrhœal cystitis, in which the nitrate of silver has the preference), and is the substance which should first be used in a watery solution of about three per cent., increasing at each injection up to six, nine, and even twelve per cent. The last-named strength will usually accomplish all that this drug can do in reducing the free secretion of pus. The intervals between injection should be two, three, or four days, according to the effect. The treatment causes practically no discomfort, and the injection may be retained as long as the patient chooses.

The sulphate of copper is used in the strength of one per cent. in pure glycerin. This solution is given in water, commencing with about one grain to the ounce and working up rapidly to full strength. This drug is markedly astringent in suitable cases.

Where a more astringent effect is aimed at than that produced by copper, the glycerio-tannin may be employed. This substance is too thick to be sucked readily into a syringe. It is thinned by the addition of water.

Nitrate of silver is exceedingly valuable in gonorrhœal cystitis, and is most useful when copper and tannin prove inefficient. The first injection should be of the strength of about one grain to the ounce. The applications are made from three to eight days apart, and are increased in strength to ten grains to the ounce. This is the harshest of the applications, but carefully used is free from danger of producing complication, and is very efficient. Thallin and nitrate of silver should not be used in the same syringe, as a black solution is made which is difficult to wash out.

urinary gush be purulent, but also the entire secondary flow will be turbid with pus. In case of doubt, the anterior urethra may be irrigated before the urinary test is applied. The pus may, of course, come from the prostate gland or the seminal vesicles; but this may be demonstrated by milking of these organs by means of a finger in the rectum, between the first and second urinary flows, urine being retained in the bladder to be ejected in a third urinary discharge, and the specimens to be examined microscopically after settling.

The clinical picture of posterior urethritis is fairly typical. After the subsidence of an acute attack of gonorrhœa, which has, perhaps, been complicated by cystitis or vesical irritability, there follows a mild gleet. So long as the patient uses an injection, his urethra remains dry and he thinks himself cured. On leaving off this treatment, however, the discharge reappears, sometimes accompanied by discomforting sensations in the anterior urethra near the meatus, or referred to the perineum, and sometimes accompanied by urinary urgency and precipitancy. Wines, spirits, or indulgence in sexual intercourse promptly aggravate the gleet. Most of these cases have the anterior urethra widely cut for a close stricture of large calibre, and are subsequently treated by large sounds, often with much benefit; frequently, however, the passage of these instruments aggravates the discharge and lights up either cystitis, prostatitis, or epididymitis. Most of these cases ultimately get well, and without local treatment.

Rest, balsams, alkalies, demulcent drinks, counter-irritations, change of air, treating of the anterior urethra, iron in chronic cases, all of these are potential, and most of these can be happily combined with local posterior treatment. Some few cases are positively unsuited to local treatment and get worse under it. Most tubercular cases, and some simple inflammatory and some ordinary gonorrhœal cases, can be classed in this group. When the treatment disagrees, symptoms become so promptly and obviously aggravated that the futility of repeating applications is at once clear. There is no danger of producing cystitis or epididymitis if instruments are used carefully and not inserted too far; the risk incurred of occasioning these symptoms is vastly less than in treating the disease with anterior injections or sounds and internal medication. The instrument employed is founded upon Ultzmann's model, differing from the latter in being made in one piece. The syringe has only one minute opening at the tip. The latter may be inserted just within the hole in the triangular ligament, that is a trifle beyond the bulbo-membranous junction. The membranous urethra grasps the tip of the instrument, and the contents of the syringe, twenty minims, or more, may be gently thrown in; the entire injection will flow backward along the membranous urethra, through the prostate, and into the bladder, with as little violence as possible, not one drop escaping at the meatus upon the withdrawal of the syringe. Instead of using a few drops of strong solution it is better to use a larger quantity of a mild solution. The entire contents of the syringe should be used in every instance, excepting when nitrate of silver is employed in a strength greater than ten grains to the ounce. The strength of a given substance is increased gradually after establishing tolerance to milder strengths. When the source of the flow of pus is reasonably well forward in the urethra

through small perforations. It is to be accomplished by means of a powder-blower with very fine nozzle. All such manœuvres must be regarded as interfering with drainage and liable to induce damming of pus and septicæmic symptoms. [There can be no cure in such cases until perfect drainage is obtained and maintained. This can be accomplished but by excision of the membrana tympani and the two larger ossicula or their remnants.—REV.]

MÉNIÈRE'S VERTIGO AND THE SEMICIRCULAR CANALS.

The experiments of Flourens, which seemed to attribute to the semicircular canals the rôle of maintaining the equilibrium of the body, have been controverted by others to such an extent as to make it appear doubtful whether that part of the labyrinth is the seat of the lesion which determines the so-called vertigo of Ménière. The peculiar character of the vomiting, the fact that the latter symptom may occur suddenly without nausea, after irritation of the membrana tympani, the intimate connections between the pneumogastric and the auditory nerve at their origin, renders it more probable that the vertigo and cardiac symptoms are due to a reflex action in the pneumogastric dependent upon a lesion in some portion of the auditory nerve. The term Ménière's disease serves more frequently to mark ignorance of the lesion which occasions a series of symptoms often analogous but which are under the influence of very different causes.—(SIR. WM. B. DALBY, *Brit. Med. Journal*, and *Annales des Maladies de l'Oreille*, etc., vol. xvii.)

AUDITORY AFFECTIONS IN TABES DORSALIS.

E. MORPURGO made a careful examination of fifty-three ataxic patients, and found that only ten possessed normal auditory apparatus.—*Annales des Maladies de l'Oreille*, etc., vol. xvii., 1891.

USE OF COLLODION IN RELAXATION OF THE MEMBRANA TYMPANI.

DR. LANNOIS, of Lyons, France, calls attention (*Annales des Maladies de l'Oreille*, etc., vol. xvii., No. 1) to the above-named treatment, first suggested, he says, by McKeown, of Belfast, in 1879. Employment of collodion has no inconveniences nor dangers, and the author thinks that it not only holds the relaxed membrana in proper position, by its contractive and extracting power, but also that it possesses a truly curative effect, as the patients continue to hear better after the collodion film is removed from the ear.

Two cases are then told in detail illustrative of the good results of this treatment in relaxed conditions of the membrana tympani. McKeown recommended to paint the collodion on the membrana, but Lannois prefers to drop into the ear a few drops of the collodion after the membrana tympani has been pushed into the normal position by inflation of the tympanic cavity.

FORMS OF OTITIS MEDIA PURULENTA IN TUBERCULOUS SUBJECTS.

According to DR. T. BOBONE, there are two principal forms of otitis media purulenta occurring in tuberculous subjects, viz.:

1. A very characteristic form: The membrana tympani presents neither

OTOLOGY.

 UNDER THE CHARGE OF

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 OPERATION FOR THE RELIEF OF DEAFNESS, NOISES IN THE HEAD AND EARS, AND VERTIGO, DUE TO CHRONIC CATARRH OF THE DRUM OF THE EAR.

In this brochure of fourteen pages (*Archives of Otolaryngology*, 1891, Part 2), Dr. SAMUEL SEXTON, of New York, gives the results of the operation of excision of the membrana and the two larger ossicula as carried out by him. Very interesting notes of seven cases are given, and Dr. Sexton then says that the list of cases might be extended if space permitted him. He offers the following conclusions:

"In certain cases the advance of progressive sclerosis, and consequent deafness, tinnitus, etc., cannot be arrested, nor, indeed, can any permanent improvement in hearing be made by means of any known local medication, directed either to the ear itself or the throat. On the contrary, valuable time may be frittered away in useless experimentation until the disease has become more and more firmly seated. This is the more lamentable in younger patients, when deafness is but beginning and is therefore amenable to an operation. The deafness due to progressive ankylosis of the ossicula may be arrested in most cases, and where the operation does not improve hearing the further increase of deafness is thus prevented. . . . All the manipulations in performing the operation are carried on in the ear through the ordinary ear speculum, introduced into the external auditory meatus." The operation is carried on under narcosis, is not attended, therefore, with pain, and there is seldom any reaction or feeling of soreness in the ear afterward. If regeneration of the membrana tympani occur, the new membrane may be cut away after the application of a 10 per cent. solution of cocaine. Regenerative processes are lessened, in Dr. Sexton's opinion, by abstaining from eating meat, both before and after the operation. The aim of the operation, of course, is to maintain an opening into the drum-cavity. An immediate result of the operation is generally an improvement in hearing high tones.

For a few hours after the operation the patient should maintain a recumbent position, and remain in the house a day or two. On the fourth day the patient may go out of doors.

If a new membrana form, the improved hearing may disappear, though this is not invariably the case, as observed by Lucae and by C. H. Burnett.

 A NEW MODIFICATION IN BORIC ACID TREATMENT OF CHRONIC SUPPURATIVE OTITIS MEDIA.

This, according to SCHEIBE (*Münchener med. Wochenschrift*, 1891, No. 14), consists in the direct insufflation of boric acid powder into the drum-cavity

time resort to a judicious use of aural therapeutic measures. Firmly convinced as I am of the value of naso-pharyngeal surgical methods, I have not thrown away the leech, douche, paracentesis knife, Politzer bag, nor catheter (for the ear); our only safeguard is the judicious use of these means, and the acknowledgment of their just therapeutic value. On the other hand, we must acknowledge the increased successfulness, or aid to success, in otological work rendered by rhinal surgeons; but while acknowledging their achievements one must remember that there are a vast number of aural cases falling under our observation thoroughly independent of any change within the naso-pharyngeal cavity, the relief of the one not arresting the retrogressive progress of the other." The author alludes to sclerotic cases with patulous Eustachian tubes. In these cases, if the patient is to have relief, he "must get it through aural therapeutic measures employed in the hands of the skilled otologist." It is nonsense for one to agitate ideas having in view the condemnation of otological therapeutic methods—they have a vast field of usefulness. What is desirable is that the aurist should become more of a rhinologist, and the rhinologist more of an aurist. Unfortunately, "one does not find in aural clinics that careful examination and treatment of the naso-pharyngeal cavity as is carried out in rhinal clinics, nor in rhinal clinics that same care and attention to the ears that one finds in aural clinics; and an appreciation of the inadequacy of the routine treatment of the case as resorted to by the aurophthalmologist."

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

UNDER THE CHARGE OF
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MORBID GROWTHS OF THE LARYNX.

A globular laryngeal tumor, about twelve millimetres in diameter, removed by DR. F. H. HOOPER, of Boston, from the anterior portion of the left vocal band and ventricle of a man fifty-three years of age (*Medical Record*, March 7, 1891, illustrated), was found on microscopical investigation to be a telangiectatic myxofibroma in a state of amyloid degeneration.

M. GAREL, of Lyon, reports (*Arch. Internat. de Lar.*, etc., 1891, No. 3) the spontaneous recession, after tracheotomy, of a papilloma occupying the entire left vocal band and the inter-arytenoid commissure of a child, four years of age, and occurring as a result of laryngitis contracted in sequence to an attack of influenza.

At the last meeting of the Pathological Society of London, DR. F. SEMON and MR. SHATTOCK (*Medical Press and Circular*, May 27, 1891) showed a papillomatous tumor which had been removed by the former from the left ary-epiglottidean fold of a man, forty-four years of age, and which, prior to

thickening nor hyperæmia, but at most only a slight rosy blush. In its inferior portion, a perforation is found the edges of which are smooth and sharp. Beyond this perforation is seen the mucous membrane of the drum-cavity, smooth, without granulations or exudation. Hearing is found considerably diminished—even to one-fifth of its normal distance.

2. The second form is seen in those far advanced in phthisis. The membrana tympani is entirely destroyed. An upper arc of the membrana is found in the middle of which the malleus is suspended. The tympanic cavity is lined with a diphtheroid membrane, grayish-white in color, not to be removed by syringing. Later in this affection caries of the petrous bone and of the mastoid apophysis are found. In this advanced form the disease, which appeared first as an indolent otorrhœa, may cause acute pain. Suppuration is slight, but the hearing is greatly diminished.

Of these two forms the first is sometimes curable, or rather arrested *in situ*. The second is incurable, and it is difficult to allay the pain it causes.—*Annales des Maladies de l'Oreille*, etc., vol. xvii., No. 1.

HEMORRHAGES INTO THE LABYRINTH, IN CONSEQUENCE OF PERNICIOUS ANÆMIA.

DR. J. HABERMANN, of Prague, has reported a case of the above nature (*Prager med. Wochenschrift*). The patient was a young woman, twenty-one years old, who, with other symptoms of anæmia, became deaf a short time before death. The post-mortem examination revealed cicatrices in the stomach from peptic ulceration, follicular enteritis of the large intestine, intense anæmia, with hemorrhages into the meninges, the brain, the pharynx, pericardium, and small intestine, and also in the retina. Fatty degeneration of the myocardium. The right organ of hearing was examined by Habermann, and the middle ear was found entirely normal. Microscopic sections of the decalcified internal ear showed a normal internal auditory canal and auditory nerve. Numerous minute hemorrhages were seen in the cochlea; otherwise the cochlea was normal. Extensive hemorrhages were found in the vestibule and in the semicircular canals. The symptoms, deafness and roaring in the ears, shown in this case before death, are to be explained probably by the hemorrhages in the labyrinth. The vertigo, which was also marked, may be referred, perhaps, to the hemorrhage in the semicircular canals, or to the simultaneous lesions in the brain.

THE IMPORTANCE OF SURGICAL MEANS APPLIED TO THE NASO-PHARYNX IN THE RELIEF OF NASO-PHARYNGEAL AND MIDDLE EAR DISEASE.

DR. C. W. RICHARDSON, of Washington, D. C. (*Journal of the American Medical Association*), writes, among many valuable things, the following: "In showing how inadequate the ordinary treatment of ear affections under the care of the auro-ophthalmologist is, I do not wish it to be understood that I am to any extent an aural nihilist. I am afraid a great many of my medical *confrères* are claiming too much for the independent use of the forceps, cautery, snare, drills and saw (in nose and throat). I doubt very much of their curing all the ills to which the ear is subject, unless they at the same

cases of infection arising after normal labor were occasioned by neglect of antiseptic precautions after labor. It was not sufficient that strenuous care be exercised during delivery, but every precaution must be taken to keep the patient clean during her lying-in period. It was found, however, that the best results were obtained by omitting all injections of antiseptic substances, and confining the attention to the most strenuous external cleanliness and antiseptis. It was also observed that in proportion as internal examinations were omitted, that mortality and morbidity diminished. It was seldom necessary in normal cases to make any further examination than such as can be made by palpation and auscultation at the commencement of labor and a systematic observation of the behavior of the uterus during labor. The drift of these studies is distinctly in the line of non-interference and restriction of examinations to palpation and auscultation.

MENSTRUATION AND PREGNANCY AFTER THE REMOVAL OF BOTH OVARIES.

ROBERTSON (*Ibid.*) reports a case in which both ovaries were removed for the relief of chronic pain and disability. Three months after the operation the patient menstruated normally, subsequently married, and was delivered of a large male child about eighteen months after the ovaries had been removed. (The most rational explanation of this case is that a portion of the ovarian stroma was left behind by the surgeon at his operation.)

REPEATED TUBAL GESTATION; OPERATION; RECOVERY.

HERMAN (*Ibid.*) reports the case of a patient from whom he had removed the right tube for ruptured tubal gestation, who came under his observation with a similar condition upon the left side of the uterus. When exposed, the tube was seen as a purplish-red ovoidal swelling at the side of the uterus, its long axis parallel with that of the uterus, and connected with it by soft adhesions. It was removed without subsequent drainage. The patient's recovery was complicated by nausea and vomiting, which took place after her first operation. She made a perfect recovery in a month after operation.

MODERN METHODS OF TREATING LINGERING LABOR.

A discussion before the British Medical Association will be found reported in the *British Medical Journal*, No. 1552, 1890, upon this subject. PLAYFAIR prefers chloral in doses of fifteen grains repeated in twenty minutes to allay the pains of the first stage of labor. A third dose is rarely required, and the drug may be given by enema if the stomach be irritable. When uterine contractions are deficient, quinine is often of service during the first stage. It is occasionally justifiable to separate the membranes, should they be attached round the internal os, by the introduction of the finger. When the anterior lip of the cervix is prolapsed and impacted between the head and the pubes, it is well to push it up between the pains by the finger. For delay in the second stage of labor, expression of the fœtus by pressure upon the uterus is often justifiable. The physician should stand beside the patient, who is placed upon her left side, and with his left hand upon the fundus of the uterus he

its examination after being taken from the throat, was thought to be an angioma. It was completely surrounded by a shell of blood-clot, and this, together with the unusual position of the growth and the spontaneous hemorrhage occasioned by its presence, were the chief features of interest presented in connection with it.

DR. LUC reports (*Arch. Internat. de Lar.*, etc., March-April, 1891) an instance of multiple or diffuse fibro-adenoma of the laryngeal and pharyngeal mucous membrane. A soldier, twenty-six years of age, had some difficulty in glutton in the summer of 1889, for which he was subjected to nine months' active treatment with iodides without effect. When seen by Luc, in June, 1890, a rounded reddish-gray tumor the size of a nut was observed behind the right palatine fold. The larynx was obstructed by a number of similar tumors of varying size, in front of the arytenoid cartilages and along the posterior and lateral walls of the larynx. They were removed after protracted operative procedures with the incandescent electric snare, the electric cautery, and cutting forceps. Subsequently a similar tumor of large size was discovered on the superior surface of the soft palate, whence it was excised with cutting forceps. Adenoid vegetations existed in abundance, which were removed with Gottstein's knife. These growths were found by Dr. Dubar to be formed in great part of fibrous tissue, with well-developed glandular acini at various portions.

An instance of a very large myxoma of the larynx is recorded by M. AD. DUDEFOY from the laryngological clinic of the Hôpital Lariboisière (*Annales des Mal. de l'Oreille, du Larynx*, etc., April, 1891). A male cook, forty-six years of age, had been treated for some time as a subject of laryngeal tuberculosis. Personal and antecedent history was good. Inspiration was easily accomplished, but expiration was difficult. Exertion exaggerated the dyspnoea and produced temporary cyanosis. The respiratory difficulty had begun about six months previously, and had steadily increased. The intense dyspnoea, unfitting the patient for work, was of some three or four weeks' duration. There was hardly any cough. For some two months the voice had begun to be hoarse at moments, and, if persistently used, temporary aphonia ensued, subsiding after repose of the voice. For two days the voice had been permanently and totally veiled, being, in fact, almost indistinct.

On laryngoscopic inspection, the epiglottis was found normal. The arytenoid region and the arytenoid folds were normal, unswollen, and a little vascularized. There was some vascularization of the vestibule of the larynx, which did not appear tumefied. The glottis was completely obstructed, save for a minute passage posteriorly, by a voluminous rounded tumor, as large as the seed of an apricot, intensely red at some points and clearer at others. There was a slight evidence of hemorrhage at the most salient part of its surface. It appeared adherent to the left side of the larynx, in part to the ventricle, in part to the glottis. Being removed in fragments with forceps by Dr. Gouguenheim, it was found on histological examination by Dr. Latteux to be a characteristic myxoma, corneous exteriorly. The laryngoscopic aspect of the tumor and its microscopic characteristics are illustrated in the paper.

DR. GEORGE STOKER reports (*Journ. of Lar. and Rhin.*, 1891, No. 5) an instance of pedunculated malignant growth removed in fragments by electro-

caustic snare from the vocal cord of a gentleman sixty-seven years of age, with subsequent electro-cauterization of the site of attachment. By one histologist it was pronounced a horny carcinoma, by the other an epitheliomatous growth. Success was complete as to voice and comfort of the patient, and there had been no recurrence nine months after the operation, although the affected vocal band remained deeply congested and somewhat thickened.

An inter-aryteuoidal sarcoma, the size of a chestnut, was removed from the larynx of a woman, fifty-eight years of age, by M. GEVAERT six years ago (*Annales des Mal. de l'Oreille, du Larynx, etc.*, June, 1891), and there has been no recurrence.

FOREIGN BODIES IN THE LARYNX, ETC.

DR. SCHOYLER, of Berlin, extracted (*Journ. of Lar. and Rhin.*, August, 1890) from the trachea of a girl of nineteen a needle attached to a feather. It had been aspirated, and could not be removed by traction on the feather. Laryngoscopic examination showed that it was fixed with one end in the bifurcation of the trachea and with the other on a tracheal ring. The needle was liberated by the aid of a probe introduced between it and the trachea.

A case of sudden death from escape of milk into the air-passages is reported by DR. EMILE MÜLLER (*Gaz. Méd. de Strasburg*, April 5, 1890). A child, five months of age, had no other indisposition than slightly difficult respiration when lying on its back. One morning, after having been nursed and laid down, it made a grimace as though sick at the stomach, became blue, and died in a few moments. At the autopsy the thymus gland was found larger than is usual, and the larynx, trachea, right bronchus, and all its divisions were found filled with milk. The size of the thymus explained the difficulty of respiration alluded to.

MR. LENNOX BROWNE reports (*The Medical Press*, December 17, 1890) an instance of supposed laryngeal cancer or phthisis in a lady thirty-five years of age, from whose larynx he had removed an impacted plate of artificial teeth which, from the history, had been aspirated into the larynx twenty-three months previously, probably during an epileptic seizure. Six weeks after its removal the patient had regained twenty-three pounds of her lost weight. It is remarkable that laryngoscopic inspections had been made by four gentlemen who had failed to detect the presence of a foreign body.

DR. WILLIAM MACEWEN reports (*Glasgow Med. Journ.*, December, 1889) a case in which a nutshell lodged in the trachea for thirteen days was removed by tracheotomy during impending suffocation. It was found buried in the posterior wall of the trachea just under the cricoid cartilage, lying obliquely, and covered to a great extent with granulative tissue, one thin layer of which was spread over the surface of the nutshell. When removed with forceps its concave surface was found to contain a mass of granulation tissue surrounding a portion of the kernel.

An interesting case from the practice of PROF. SONNENBURG is reported by HERMES (*Deut. med. Ztg.*, June 23, 1890). A girl, aged seventeen years, had swallowed a needle the September previous, and had since suffered with intense gastric pains, compelling her to keep the body bent forward. The parts were cut down upon and a projecting point was found in the posterior

edge of the transverse fascia. The peritoneum was incised at this point and the needle was found in a mass of connective tissue in which it had become engaged after having perforated the stomach.

WOUNDS OF THE LARYNX.

A gunshot wound of the larynx is reported by DR. G. FABIANI (*Arch. Ital. di Lar.*, July, 1890). A ball from a revolver penetrated the right wing of the thyroid cartilage. Tracheotomy became necessary the following day. Death by septicæmia ensued a few days later. The ball was found to have passed through the left ventricular and vocal bands and to have fractured the base of the left arytenoid cartilage.

FRACTURE OF THE LARYNX.

DR. UBERT CLARAC reports (*Gaz. des Hôp.*, September 25, 1890) an instance in a man, due to sudden contact against an iron plate which was projecting from a wagon, and which knocked him over backward. Although the symptoms were marked and cutaneous emphysema extensive, tracheotomy was not performed. Sudden dyspnoea and cyanosis occurred on the fourth day, and although tracheotomy was then performed, the patient expired as the trachea was opened. The cricoid cartilage was found to have suffered a double fracture one centimetre to each side of the middle line, and there was nearly complete rupture of the crico-tracheal membrane. The fracture to the right was complete, the fragment separated and the mucous membrane torn. The fracture to the left was in the form of a Y, the lower portion of which was vertical and inferior, and the fragments were in contact. The vocal bands and the ventricles were ecchymosed. The ary-epiglottic folds were the seat of considerable emphysema. Emphysema was extensive in the connective tissue of the mediastinum, the whole cellular tissue protruding hernia-like, when the thoracic covering was removed. The emphysema had invaded the entire trunk and the upper part of the hips. Both lungs were engorged. A little blood was in the trachea.

[It need hardly be said that the issue in this case exemplifies the importance of immediate tracheotomy in all cases of fracture of the larynx, even if performed only as a prophylactic measure; although it must be admitted that severe injury to the cricoid cartilage is fatal in the great majority of instances despite the most judicious management.—Ed.]

SURGEON E. JEAUMAIRE reports (*Arch. de Med. et de Pharm. Militaire*, January, 1890) a case of multiple fracture of the larynx and of the hyoid bone in an artilleryman. While engaged in helping to move an engine formed of two beams connected by a transverse bar of iron, he slipped and fell backward, the bar of iron striking the anterior portion of his neck violently. He expectorated considerable blood, was unable to swallow, and was aphonic. Palpation increased a violent pain felt in the swollen neck, chiefly over the hyoid bone and the thyroid cartilage. At each inspiration a slight depression was noted over the region of the greater horn of the left wing of the thyroid cartilage. There was no emphysema, and there was no crepitation. Death ensued on the seventh day. The hyoid bone was found to have sus-

tained an incomplete fracture or fissure six millimetres in length directed vertically from the upper border of the bone to a point of union of the right horn with the body of the bone. The large horn of the right wing of the thyroid cartilage was completely fractured some millimetres above its union with the lateral face of the cartilage. A vertical fracture in the middle line separated the cartilage into two portions for its entire length, the edges being turned outward, especially on the left side. There were two symmetrical perpendicular fractures of the cricoid a little within the facets where the cricoid cartilage is articulated with the smaller horn of the thyroid cartilage, that on the right side being a centimetre in length, and that on the left being a little less extensive.

DERMATOLOGY.

UNDER THE CHARGE OF

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PSOROSPERMOSE FOLLICULAIRE VÉGÉTANTE (DARIER).

A. R. ROBINSON, of New York (*Canadian Practitioner*, vol. xvi.), gives an admirable exposition of this subject, which is now attracting so much attention. According to Darier there exists in man a group of cutaneous diseases which merit the name of psorospermiosis, being due to the presence in the epidermis of parasites of the order sporozaires, of the group psorosperms, or coccidia. In one of these diseases the coccidia of a particular species invade the follicular orifices of a greater portion of the cutaneous surface, where they appear in the form of round bodies, generally encysted and contained in the epithelial cells, or as refracting granules, the accumulation of which forms a plug which projects from the orifice of the follicle. This is the disease described by J. C. White as keratosis follicularis, and by Darier and Thibault under the name psorospermoze folliculaire végétante. Darier adds, that "the presence of these bodies enables one to make a diagnosis of the disease, as they are not met with in any analogous clinical affection. The neck of the follicles invaded become secondarily the seat of papillomatous vegetations, which can develop to a great degree and form real tumors. The affection, from an etiological point of view, should be placed with Paget's disease of the nipple, and probably with molluscum contagiosum."

Neisser, of Breslau, regards molluscum contagiosum as caused by psorosperms, but this view is not as yet generally accepted—many pathologists, like Robinson and others, regarding the molluscum bodies as chemically changed epithelial cells and not organisms, although believing the disease to

be a communicable one and parasitic in nature. In epithelioma, especially that clinical form known as Paget's disease of the nipple, which was generally considered to commence as an eczematous process, Wickham has endeavored to show that psorosperms are very abundant, and argues that they are essential factors of the disease and the cause of the anatomical changes which occur.

Robinson quotes the cases of J. C. White and of Darier, and gives the notes of a case observed by himself, Weiss and Lustgarten, of New York. All these cases represent the same affection. Dr. Robinson's microscopical studies upon his case show the disease to be a "para-typical" keratosis. Darier and Bowen (in White's case) came to similar conclusions.

APPLICATION OF DRYING-IN LINIMENTS (LINIMENTA EXSICCANTIA) IN THE TREATMENT OF SKIN DISEASES.

PROFESSOR PICK, of Prague (*Prager medicin.-Wochenschr.*, Jahrgang xvi.), after referring to the gelatin preparations brought forward by him some years ago, calls attention to a new remedy with which he has been experimenting, namely, bassorin (obtained from tragacanth). This kind of gum differs from gum arabic in being almost insoluble, but swells up with water into a syrupy mass which permits of being smeared over and rubbed into the skin in a remarkably satisfactory manner, and drying-in as a thin and delicate covering or film. The formula given consists of tragacanth 5 parts, glycerin 2 parts, water 100 parts, which makes the best consistence. It may be prepared hot or cold. According to the latter method, the finely powdered tragacanth is rubbed with water, the mass taking on a smooth syrupy or lanolin-like character. The application is, when first used, cooling to inflamed skin. As it dries in, a fine, smooth, dry covering forms, with, in the case of inflamed skin, a feeling of tension, which however is not painful, and in its results is beneficial.

A variety of medicaments, both soluble and insoluble, may be added to the base, as in the case of the gelatin preparations and pastes.

BASSORIN PASTE: A NEW BASE FOR DERMATOLOGICAL PREPARATIONS.

This paste, proposed by ELLIOTT (*Journal of Cutaneous and Genito-urinary Diseases*, vol. ix.) is composed of bassorin, glycerin, water and dextrin. The author's experience permits the following conclusions: 1. Bassorin paste is a perfectly neutral substance, which of itself produces no irritation whatever, and when used alone simply acts as a protective to the skin. It does not become rancid, or decompose, or undergo changes when kept for a length of time, unless it be exposed in an open vessel. When this is done it becomes dry and hard, but even then rubbing it up with a little water renders it again as serviceable as at first. 2. It is easy and simple in application, requiring only to be spread upon the skin with the finger or a brush. It dries in the space of a few minutes if so applied, adheres closely, does not rub off and soil the linen, but forms a flexible coat, which does not interfere with the movements of the body. When its removal is desired, the preparation can be washed off with a little water or a damp cloth or sponge. It remains *in situ*

without change for a variable length of time, depending upon the condition of the surface on which it has been applied. 3. With the bassorin paste almost any drug can be incorporated: those which exist in the form of powders or in solid form in any amount desired; the tars, ichthyol, and oily substances in smaller percentages, but sufficient for all practical purposes. 4. The action of drugs incorporated with it and their effect upon disease appears to be as good as when such are used in other excipients—or perhaps better in some cases. 5. It is of wide applicability and of value in both acute and chronic forms of disease, its use being limited only by the degree of moisture on the surface being treated, or to which it may be exposed.

The exact proportions of the various constituents of this paste are not given by the writer, it being added that the chief one is bassorin.

REPORT OF A CASE OF LUPUS VULGARIS TREATED WITH KOCH'S TUBERCULIN.

LOOMIS and FULLER report (*Journal of Cutaneous and Genito-urinary Diseases*, 1891) a case of long-standing lupus treated successfully by Koch's method. The disease was complicated by an epitheliomatous growth. The case was under treatment twelve weeks, receiving in all twenty-two injections. Five weeks after the beginning of the treatment the disease appeared to be cured. Marked local changes and constitutional reaction occurred during the first two weeks, since which time fever reactions were noted but twice; local disturbances continued during the first month, becoming less and less perceptible. The epithelioma has shown no reparative changes, although the injections were followed by evidences of local reaction. The highest dose was 0.015 c.c. As to the permanency of the cure time must decide. An interesting feature was the fact that the lymph rendered apparent foci of disease before unrecognized.

LUPUS VULGARIS TREATED WITH TUBERCULIN: DEATH RESULTS.

A case of long-standing lupus of face treated with tuberculin, in which death followed thirty-six hours after an injection of two milligrammes, is reported (*Wien. klin. Wochenschrift*, iii. p. 972) by GARISCH. The patient was otherwise healthy. At the same time several other patients were being treated by the same fluid, but showed nothing more than the usual reactions. Following the injection the patient became somnolent; the next day heart action was so frequent that the pulse could not be counted. Patient failed to respond to stimulation and died of heart failure that evening.

At the autopsy were noted: pneumonic infiltration and œdema of the lungs, œdema of the brain and spinal cord, acute swelling of an already enlarged spleen, and slight parenchymatous swelling of liver and kidneys. The pleura, pericardium and spinal cord were the seats of capillary hemorrhages. The local disturbances in the lupus tissue were typical.

AN EXTENSIVE CASE OF FAVUS.

MORRIS places on record (*British Journal of Dermatology*, vol. iii.) an extremely unusual and extensive case of favus. The patient, a female, aged

thirty-seven years, when coming under observation was suffering with acute phthisis, of which she soon died. Upon examination the scalp, trunk, arms were found to be the seat of favus crusts; the scalp completely covered, the trunk to a great extent, and the arms to a less degree. The finger-nails were also invaded. The disease, according to the statement of the patient, began on the scalp fourteen years previously, gradually involving the whole of that region; two months before coming under the writer's observation the back became affected, and from that time the disease had rapidly invaded other parts of the trunk and arms. The several points of interest in this case are: the extensive area involved, the late age (twenty-three years) at which disease first began, the involvement of the nails, and its rapid spread during the last stage of phthisis.

A CLINICAL STUDY OF PRURITUS HIEMALIS.

CORLETT reports (*Journal of Cutaneous and Genito-urinary Diseases*, vol. ix.) several cases of this disease—the so-called frost or winter itch. The author's observations as summarized are in the main the experience of others: "1. That the state of the general health has no (?) appreciable effect upon the pruritus. 2. The local irritation of the clothing, although capable of aggravating the malady, is not of itself able to produce it. 3. Meteorological conditions appear to furnish the main etiological factor. These were most potent with a low temperature, low humidity and the wind blowing from the northwest. The greater the velocity of the wind, *cæteris paribus*, the more severe the itching. 4. Pruritus hiemalis is not infrequently associated with other neuroses of the skin."

The author places little reliance upon internal treatment, inasmuch as, with the possible exception of ichthyol, it proved negative. The most efficient local measures employed, which are in the main necessarily palliative, consisted of resorcin, ichthyol and menthol lotions, the first named being usually of greatest benefit. Change to a warm and humid climate, where also the temperature variations are but slight, is curative.

OBSERVATIONS ON TWO CASES OF LUPUS TREATED BY KOCH'S TUBERCULIN.

These two cases, reported by LESLIE PHILLIPS (*British Journal of Dermatology*, vol. iii.), represent deep-seated and superficial types of the disease. In the former case the patient, a male, aged twenty-six years, exhibited the disease, of eight years' duration, on the cheek and ear. In the other—superficial case—the patient, a female child, aged three and a half years, presented two patches, one on the centre of the cheek, and the other on the dorsum of the hand; this latter was secondary, and was, the writer believed, due to auto-infection, the child having the habit of sleeping with this part of the hand curled under and applied to the cheek. Both cases were perseveringly treated by injections of tuberculin in increasing doses, with characteristic reaction. The result in the deep-seated variety was negative; in the superficial type—the child—the result was satisfactory, the two patches "were smooth, pale-red in color, homogeneous in appearance, and entirely free from nodules, either in the cicatrix or in the margin." Six weeks later, "The scar

on the back of the hand is paler, and no suspicion of lupus present; but the periphery of the patch on the cheek is redder, and at one or two points are seen spots which suggest the return of lupous foci."

OBSTETRICS.

UNDER THE CHARGE OF

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VISITING OBSTETRICIAN TO THE PHILADELPHIA HOSPITAL, ETC.

PERFORATION OF THE UTERUS FOLLOWING AN INTRA-UTERINE DOUCHE; SUBLIMATE POISONING.

GEHBARD (*Zeitschrift für Geburtshülfe und Gynäkologie*, Band xxi., Heft 2) reports an interesting case in which intra-uterine douches were given to a multipara in the treatment of gonorrhœa. The patient was not pregnant at the time. While the third douche was being given the patient complained of pain in the abdomen, followed by giddiness, vomiting, and unconsciousness. Rapid pulse, with pallid features and perspiration, followed her recovery from the shock of the injection. Symptoms of mercurial intoxication, with bloody, mucous diarrhœa supervened; the patient dying eight days after the injection. On post-mortem examination two perforations of the uterus were found, admitting a uterine sound readily. The sublimate solution, 1:5000, had been absorbed by the peritoneum. Microscopic examination of the kidneys showed the epithelium of the tubules infiltrated with an amorphous substance from which calcium crystals were readily produced by treating with sulphuric acid.

PUERPERAL PSYCHOSES, WITH REFERENCE TO ECLAMPSIA.

OLSHAUSEN (*Ibid.*) reviews the literature of the puerperal psychoses with especial reference to the relation between them and eclampsia. He concludes that psychoses are not rare after eclampsia, developing usually from two to four days after the eclamptic outbreak. Hallucinations are constant, the derangement proceeds rapidly, without fever, and usually tends to eventuate in recovery. Mental derangement persisting for several months is rare after eclampsia. It is as yet impossible to say what cases of eclampsia especially predispose to psychoses; mental derangement follows various intoxications, and among these are affections following chronic kidney lesions and uræmia.

Olshausen divides puerperal psychoses into: 1. Those following fever—infection psychoses. 2. Idiopathic, without fever or constitutional cause; under this head are included the greater part of the psychoses of the puer-

peral state, that accompanying lactation and following hemorrhage at labor.
3. Intoxication psychoses, following eclampsin, or exceptionally with uræmia without eclampsia.

KNOTS IN THE CORD IN TWIN PREGNANCIES.

An instance of this rare complication of pregnancy is reported by HERRMANN (*Archiv für Gynäkologie*, Band xl. Heft 2). But sixteen cases could be recorded, and as this complication can only arise when the twins occupy the same foetal sac, its occurrence is rare.

Herrmann's case was one of twin abortion in a multipara, following a fall. The cords seemed fused together in an ovoid mass, which on careful examination was found to be two intertwined figure-of-eight knots. Such intertwining of cords has been observed to follow violent foetal movements, and also sudden exertion on the mother's part. In the great majority of cases foetal death and premature labor follow.

PREGNANCY COMPLICATED BY FIBRO-CYST OF THE OVARIAN LIGAMENT; ECTOPIC PREGNANCY, TREATED BY LAPAROTOMY.

DOLÉRIE (*Nouvelles Archives d'Obstétrique et de Gynécologie*, No. 7, 1891) reports the case of a woman who bore a dead child after a protracted labor complicated by the presence of a fibro-cyst of the ovarian ligament. Recovering from this labor she became again pregnant and bore a living child at term. When lactation ceased, her menstruation became deranged, and she consented to laparotomy for the removal of the tumor. This was readily accomplished, the mass proving to be what had been diagnosticated. Uninterrupted recovery followed.

Dolérie also reports the case of a woman, married eight years without conception. After amenorrhœa of two months' duration, she expelled a membranous mass from the uterus, with great pain. On examination the uterus was found slightly enlarged. A small tumor could be felt on the left side, behind the uterus. A diagnosis of salpingitis with hæmato-salpinx was made and the uterus was curetted and disinfected. Three days later laparotomy was performed, when tubal pregnancy was found on the left side, and upon the right a sclerosed ovary. The patient made an uninterrupted recovery after the removal of both.

THE PROTECTION OF THE PERINEUM DURING THE PASSAGE OF THE SHOULDERS.

COUDER (*Archives de Tobologie et de Gynécologie*, No. 7, 1891) has found it of advantage to unfold an arm when the shoulders present with folded arms after the expulsion of the head. When a hand presents before the shoulders, it should be drawn down and the arm entirely delivered. When this is not possible, the hips of the mother should be raised, and when the head has rotated externally, the head must be pulled down and the anterior arm freed to the elbow. The elbow is then to be flexed toward the back of the foetus and the anterior arm entirely extracted. The head is then to be raised and the trunk allowed to emerge slowly.

THE DEVELOPMENT OF THE PLACENTA.

A possible explanation of some clinical facts is afforded by YOUNG, in a summary, the results of investigations upon the development of the placenta. It seems probable that the foetal epiblast extends over the greater part of the placental area, replacing the maternal decidua and resembling in its growth the formation of epithelial tumors. This mass of epithelium is tunnelled by blood spaces communicating with maternal bloodvessels into which foetal capillaries, free from epithelial investment, project.

These facts explain the ready passage of micrococci from mother to foetus. Foetal nutrition results from ready diffusion through the walls of the capillaries. After abortion, retained placental epithelium and continued development of foetal epithelium may result in carcinoma.—*The Medical Chronicle*, No. 4, 1891.

MATERNAL IMPRESSION FOLLOWED BY THE PRODUCTION OF A MONSTER.

An interesting example of the direct association of maternal impression and the production of monsters is given by GROUND (*Northwestern Lancet*, No. 15, 1891). A primipara, illegitimately pregnant, gave birth to a seven-months' foetus in which the arch of the skull was absent, and other malformations existed, giving the foetus an especially horrible appearance. Shortly after, a pregnant patient saw the monster in a jar in a physician's office, and was deeply impressed by its appearance. Six weeks after seeing the monster, she aborted at four months with a monster closely resembling the first.

GYNECOLOGY.

UNDER THE CHARGE OF

HENRY C. COE, M.D., M.R.C.S.,
OF NEW YORK.

THE ACTION OF THE GALVANIC CURRENT UPON UTERINE FIBROIDS.

BÄCKER (*Centralblatt für Gynäkologie*, No. 28, 1891) reports a case in which intra-uterine galvauization was employed for five months at intervals of two or three days, the strength of the current varying from 50 to 140 milliamperes. At the end of this period the tumor had decreased in size one-half, several necrosed fragments having been discharged *per vaginam*. From a careful analysis of similar recorded cases it appears that whenever a fibroid tumor is positively reduced in size by the action of galvanism, this is due to softening of the deeper parts of the neoplasm, with subsequent contraction of the surrounding tissue. There is probably an actual formation of thrombi in the vessels of the tumor. The process of electrolysis does not consist so much in a decomposition of the albumins; the current follows principally the

should press strongly downward in the axis of the brim. The use of the forceps is often avoided by this manœuvre. Regarding the use of the forceps, the attitude of the practitioner should be one of constant watchfulness as labor progresses. When it is evident that the mother's powers are exhausted, delay should instantly cease, and the use of instruments be chosen.

In discussion upon this subject, the general drift of opinion was that during the first stage of labor the hot vaginal douche, the use of a narcotic to remove the inhibitory action of pain, and such assistance as change of posture would afford were all considered advisable. During the second stage, the cautious use of instruments was urged.

THE PROGNOSIS OF LABOR AND THE PUERPERAL CONDITION IN OLD PRIMIPARÆ UNDER ANTISEPTIC PRECAUTIONS.

ERDMANN (*Archiv für Gynäkologie*, Band xxxix. Hest 1) concludes from an extensive study of labor in old primiparæ that there is no definite limit, so far as age goes, by which to determine that a patient is, or is not, to be considered as an old primipara. It depends upon individual characteristics and not upon any especial age in month or years. At twenty-seven, the characteristics which are of practical importance in these cases are already present. The number of illegitimate births bears no relation to the age of the mother.

In the case of old primiparæ it is found that menstruation is usually deranged, producing a condition of anæmia and constitutional weakness. Such patients have, therefore, as a rule, a weaker constitution than young primiparæ. Contracted pelves are more frequent in these cases. Cœdema and pernicious vomiting are not especially frequent. Eclampsia increases in frequency with a patient's age. Abnormal presentations and positions are also more common, especially breech presentations. The duration of labor increases in these patients, and inefficient labor-pains are common. Obstetric operations are more frequent and bear a close relation to the size of the pelvis, the rigidity of the soft parts, and the vigor of the pains. The mortality of the mothers in labor, when old primiparæ, has been reduced by the introduction of antiseptics to the usual rate. The procedure of incising the cervix and the walls of the birth-canal has resulted in lowering the mortality among children in these cases.

Thirty-six per cent. of all abortions in primiparæ are caused by syphilis, and 23 per cent. of all children perishing after the age of viability also die from syphilis. Uterine involution is slower in proportion with the patient's age. Febrile affections during the puerperal period are not more frequent with these patients than with others, a result obtained by the use of antiseptic precautions in labor.

THE TRANSMISSION OF THE BACILLI OF TYPHOID FROM MOTHER TO FÆTUS.

GIGLIO (*Centralblatt für Gynäkologie*, No. 46, 1890) contributes an interesting and thorough report of the examination of a fœtus and appendages in a case of typhoid fever occurring at Palermo. The expulsion of the fœtus occurred forty-six days after the beginning of the fever. The fœtus and placenta seemed absolutely normal. Upon macroscopic examination, no

level of a simple ovariectomy, and there is no unsightly and painful cicatrix, or risk of hernia. The patients are free from the discomfort incident to traction of the stump.

[This would appear to be the ideal operation for fibroids, although the technique is not new, as the writer admits the closure of the peritoncum to be the essential improvement. When the patient is placed in Trendelenburg's posture, as recommended by Dr. Krug, of New York, we have found that total extirpation of the uterus can, in an ordinary case, be performed with the expenditure of but little more time or labor than supra-vaginal amputation. Whether the removal of the stump seriously weakens the pelvic floor, and leads to subsequent prolapse of the vagina and bladder, is a point to be settled only after a number of patients have been kept under prolonged observation.—H. C. C.]

THE ULTIMATE RESULTS OF VAGINAL HYSTERECTOMY FOR CANCER.

LEISSE (*Archiv für Gynäkologie*, Band xl., Heft 2) replies to the criticisms of the statistics of the Dresden clinic by presenting a tabulated statement of the histories of all the patients, so far as they could be obtained. These are compiled with great care. Of eighty patients who were heard from upwards of two years after the operation, 56.25 per cent. were still living. Since eight of the deaths were not due to a recurrence of the disease, this leaves the actual mortality only 17.8 per cent. Thirty-seven of the forty-five surviving patients were examined at the clinic, so that there was no question as to their local condition, and in the other cases reports were received from competent physicians. The following are the facts: Of eighty patients examined over two years after operation, forty-five were free from recurrence; 58.6 per cent. (out of fifty-eight patients examined) were well after three years; 59.5 per cent. (out of forty-two) after four years; 60 per cent. (out of thirty) after five years; 66.6 per cent. (out of nine) after six years; and the two patients who had survived the operation seven years were both perfectly well. [The writer properly makes no comment on these statistics. They need none. So conscientiously have they been compiled that no room is left for scepticism. The opponents of vaginal hysterectomy will find in them food for reflexion.—H. C. C.]

THE RESULTS OF HIGH AMPUTATION OF THE CERVIX UTERI FOR CANCER.

WINTER (*Ibid.*) commends the operation in cases of commencing epithelioma of the portio vaginalis. Subsequent observation of patients on whom high amputation has been performed has shown that not only is conception possible, but that parturition may occur normally. Obstructive dysmenorrhœa is rare after the operation, and is easily overcome; neither has the writer observed the development of marked endometritis, as claimed by Schauta. The principal argument in favor of high amputation, in incipient cases, as compared with total extirpation, is the less danger attending the former operation. At the Berlin clinic 35.7 per cent. of the patients were free from recurrence upward of two years after operation.

[The relative claims of the two operations could be more accurately deter-

course of the vessels and secondarily decomposes the interstitial fluid. The necrotic process which follows is aseptic and is unaccompanied with fever or other evidences of inflammation, as in cases reported by Gusserow. This is a strong argument in favor of the powerful antiseptic action of the positive pole, as claimed by Apostoli.

FIBROMA OF THE OVARY.

At a recent meeting of the Vienna Obstetrical Society, LIHOTZSKY presented a fibrous tumor of the ovary, weighing six pounds, which had been complicated with ascites. It was removed successfully from a patient twenty-three years of age. Chrobak stated that he had removed a similar neoplasm of smaller size, which was also attended with ascites. The latter complication, which was usually present only with malignant growths, he believed was due to excessive dilatation of the vessels, although Olshausen ascribed it to irritation of the parietal peritoneum. Hofmohl held that in the ascites accompanying ovarian fibromata the fluid was clear, whereas in cases of malignant disease it possessed a characteristic turbidity. [No satisfactory explanation has yet been offered for the presence of ascites in connection with ovarian fibromata. The accumulation of fluid is entirely out of proportion to the size of the tumor, which would seem to disprove the theory of peritoneal irritation. Moreover, the smaller fibromata are often hard and non-vascular; the vessels in the pedicle are of average size, and there is no evidence of venous obstruction and dilatation. It is well known that these tumors have usually long pedicles and are seldom adherent, so that they are freely movable. This fact would seem to suggest the possibility of the ascites being due to direct pressure upon large veins, were it not for the absence of œdema of the lower extremities. Torsion of the pedicle may exist without ascites. We have discussed this interesting class of neoplasms at length in the *American Journal of Obstetrics*, vol. xv. p. 561.—H. C. C.]

ABDOMINAL EXTIRPATION OF THE FIBROID UTERUS.

LIHOTZSKY (*Wiener klin. Wochenschrift*, No. 27, 1891) reports ten cases of abdominal hysterectomy in Chrobak's clinic with only one death, from causes independent of the operation.

Chrobak's technique is briefly as follows: After ligating the broad ligaments, the operator dissects off the peritoneum anteriorly and posteriorly, and separates the bladder as low as the vaginal fornix. The cervix is then constricted with a rubber cord, the tumor is removed, and the cavity of the stump is packed with iodoform gauze (after being thoroughly cauterized), which is closed in with temporary sutures. The vaginal fornix is then opened, a sound being introduced from below as a guide; the uterine arteries are tied, and the stump is removed. After tamponing the wound from above, the edges of the peritoneum are united in such a way as to cover in the stumps of the broad ligaments, and the abdominal wound is closed, drainage being maintained *per vaginam*. The advantages of this method over supra-vaginal amputation are not only the avoidance of the danger of sloughing of the stump, but the shortening of the period of convalescence, and the doing away with repeated dressing of the wound. The operation is practically reduced to the

vessels are the seat of marked changes. 4. Cystic degeneration of the Graafian follicles is common. 5. The primordial follicles are destroyed.

[Every pathologist will be inclined to agree with the latter writer. Hofmeier's deductions are clearly founded on insufficient anatomical evidence.—H. C. C.]

THE INFLUENCE OF THE CLIMACTERIC UPON FIBRO-MYOMATA.

MÜLLER (*Ibid.*) has made a careful study of this subject, based upon 109 cases. He found that while in many cases the tumor evidently diminished in size after the menopause, in nine instances it was clearly proved that the neoplasm continued to grow; such an increase in size was noted in women aged fifty-six and seventy-nine respectively. He infers that it is not safe to trust too much to the curative influence of the menopause.

In opening the discussion Werth took occasion to differ from Hofmeier regarding the effect of castration. The removal of the ovaries had, he believed, a direct atrophic influence upon the tumor. When menstruation ceases its vascular supply is diminished, but if the hemorrhages continue atrophy does not take place. Tait's statements on this question were valueless.

Benckiser stated that in examining a fibroid uterus removed three months after castration had been performed, he found the same atheromatous changes in the vessel walls which were so often observed after the climacteric. This was a form of obliterating endarteritis which Thoma had described as a result of extensive arrest of the capillary circulation of an organ.

Veit said that he had seen large myomata increase in size in elderly women. He did not expect retrograde changes to take place in the tumor before the age of fifty or fifty-four. Progressive increase of the neoplasm after the climacteric must be due to some unusual source of blood-supply.

Fritsch had found that the occurrence of both the artificial and the natural climacteric arrested the growth of the tumor. If it continued to grow, it was usually due to cystic degeneration of the neoplasm.

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mined if operators would only state clearly the exact anatomical condition in every case of total extirpation. It goes without saying that when the disease is limited to the portio, the chances of recurrence after either operation are vastly less than when it has extended along the cervical canal as high as the os internum. We may safely assume that, in the hands of an expert operator, recurrence within six months after total extirpation means that the case was not a proper one for the radical operation. Every honest surgeon ought to be willing to frankly acknowledge this. Americans will never succeed in settling this vital question until they lay aside personal, and what might be termed national, prejudices and discuss it in a broad scientific spirit.—H. C. C.]

THE AFTER-TREATMENT OF LAPAROTOMY.

KEHRER (*Ibid.*) read a paper on this subject at the recent meeting of the German Gynecological Society, in which he referred to the fact that the diminution in the mortality was due to the simplification of the technique. In a considerable proportion of the fatal cases death was due to heart-failure, pneumonia, and chloroform. The greatest danger from the operation, he believed, was due to the escape into the cavity of septic fluids, especially pus, fecal matter and portions of malignant growths. The usual practice was to remove these by sponging and irrigation, but the reader believed that it was better to prevent them from escaping by surrounding the pedicle of the tumor with a rubber cloth in the form of a sleeve and packing its cavity with gauze, so that any fluid which escaped would at once be absorbed. The pedicle could then be tied and the entire mass be removed without exposing the tumor.

In order to prevent the formation of adhesions no antiseptic fluids should be brought in contact with the peritoneum, nor should any strong antiseptic be applied to the stump. Early evacuation of the bowels was correct both in theory and practice, since after every abdominal section the intestines were in a state of atony. Finally, it was highly important that there should be a firm cicatrix in the line of the incision in order to prevent the subsequent development of hernia. If the linea alba was much relaxed it was better, he thought, to excise sufficient tissue to obtain firm union.

THE CONDITION OF THE OVARIES IN CASES OF FIBRO-MYOMA.

HOFMEIER (*Ibid.*) calls attention to Hegar's theory that after castration not only is the influence of the ovarian nîsus eliminated, but a diminished amount of blood is supplied to the tumor. He believes that in the majority of the cases the latter fact alone explains the cure. In two instances he found the ovaries atrophied, with few or no traces of ovisacs, yet hemorrhage ceased after their removal. He asks if the same result might not be obtained by simply ligating the ovarian arteries.

BULIUS (*Ibid.*) has examined the ovaries in fifty cases of uterine fibromyoma, and finds that anatomical changes are the rule. He makes the following deductions: 1. In cases of fibro-myoma the ovaries undergo changes. 2. The stroma is the seat of both hyperplasia and hypertrophy. 3. The

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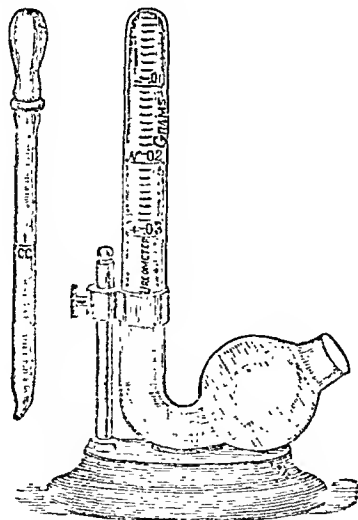
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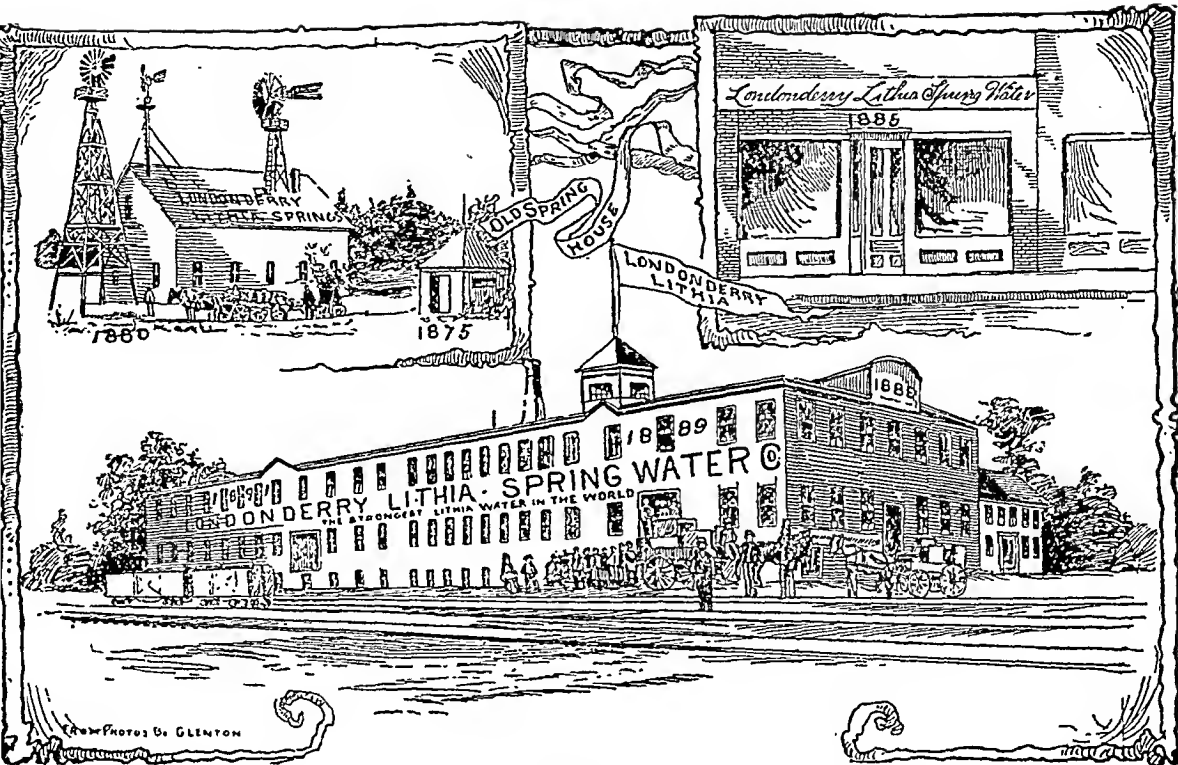
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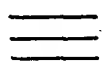
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Secure as a Government Bond—The New York Life Insurance Company (assets, \$105,000,000.00) will *guarantee* you, in one policy, *family protection*, in case of death; an *annuity* for as long as you may live, at a specified age. This Bond covers *two* necessities, for a moderate yearly deposit limited to 15 or 20 payments.

Respectfully yours,

L. C. VANUXEM & CO.,

General Agents for Pennsylvania, Ohio and Delaware,

331 & 333 Walnut Street,

Philadelphia.

THE MOST Perfect Artificial Infant Food

It goes without saying that a child, to be perfectly nourished, should be fed on healthy human milk, or its equivalent, during the nursing period, or at least until seven months of age. If a child under seven months of age **MUST** be **ARTIFICIALLY NOURISHED**,

LACTO-PREPARATA

is the only Food which meets every requirement, as it is the only perfect **ARTIFICIAL HUMAN MILK** ever produced; when dissolved in lukewarm water it practically resembles human milk in *composition, character, and taste*.

It is made from pure cow's milk, contains no cereals in any form, and is treated according to the directions of **PROF. ATTFIELD FOR STERILIZING MILK**.

LACTO-PREPARATA and **CARNRICK'S FOOD** are now put up in air-tight cans **ONLY** and will keep perfectly.

CARNRICK'S FOOD

is composed of two-thirds of **LACTO-PREPARATA**, and one-third of dextrinized wheat, and is more especially intended for children from seven months to two years of age.

A PROPOSITION TO ANY PHYSICIAN.

*The flesh of all children fed *alone* on **LACTO-PREPARATA** or **CARNRICK'S FOOD** is *firm* and *solid*, because they contain the requisite amount of *albuminoid constituents*.

The flesh of all children fed alone on any other Milk Foods (containing as they do 90 to 94 per cent. of cereals), is soft and flabby, because they do not contain sufficient nitrogenous elements, and the children thus nourished will in consequence quickly collapse when attacked with any serious complaint.

We respectfully request Physicians who are prescribing these Foods to examine the flesh of the Infants and verify our statements.

We are so confident that our Foods are practically perfect as substitutes for healthy human milk that we will furnish gratis to any Physician who is now prescribing other Foods or cow's milk, sufficient of our preparations to enable him to judge of their dietetic value in perfect nourishing qualities, as compared with other foods for similar purposes.

REED & CARNRICK,

Manufacturing Chemists,

NEW YORK.

pathological condition was discovered; microscopic examination of the blood was also negative. Bacterial culture of the maternal blood resulted in the production of a bacillus, cultures of which bore the marks of those of typhoid fever. When these cultures were compared with those made directly from typhoid material, it was found that both germinated after twenty-four hours, and that after four days points of difference in minute particulars could be detected, although the general resemblance was striking. Cultures made from the milk showed the presence of bacteria exactly resembling those obtained from a typhoid case not complicated by pregnancy. Upon potato, comparative culture-tests established the identity of the case in question with typhoid. A bacteriological examination of the fœtus and its appendages resulted in identifying bacilli found in the fœtus with the bacilli described by Eberth as indicating typhoid. The case is especially interesting from the thorough manner in which it has been studied, and the positive results obtained.

THE INDICATIONS FOR THE INDUCTION OF LABOR.

At the recent International Congress PARVIN (*Archiv für Gynäkologie*, Band xxxix. Heft 1) describes the indications for the induction of labor as, first, incoercible vomiting. In ten cases which he has collected which were so treated, in eight the mother recovered, and five living children were born. The mortality-rate was inconsiderable.

Other indications for the induction of labor were, diseases of the kidneys, heart disease, capillary bronchitis, pneumonia, œdema, and phthisis. In ten cases of phthisis, in six the mother recovered. In affections of the nervous system, namely, eclampsia, and meningitis, six cases out of nine recovered after the induction of labor. The most frequent indication, however, was abnormality of the pelvis; out of 988 cases of induction of labor, 870 were performed for this cause.

THE OPERATIVE TREATMENT OF ECLAMPSIA.

HALBERTSMA (*Ibid.*) has collected ten cases of eclampsia treated by Cæsarean section. Two of these cases perished, or 20 per cent. The average mortality, under treatment by narcotics and warm baths, in twenty cases, was 17 per cent. for the mothers and 77 for the children. Halbertsma urges in cases of eclampsia occurring at term, treatment by baths and narcotics until labor can go on. In cases where labor begins but is delayed, he would incise the cervix deeply, and deliver the patient. In severe cases, where some time must elapse before labor can occur, he would perform the Cæsarean operation. He would not allow a patient to perish undelivered.

THE PROGNOSIS OF PREGNANCY COMPLICATED BY TUMORS.

GORDES (*Centralblatt für Gynäkologie*, No. 45, 1890) gives an interesting account of sixteen cases of pregnancy complicated by abdominal tumors. In four, abortion followed, and removal by surgical treatment. In four, pregnancy was ended by amputation of the uterus, and once by Cæsarean section. Out of sixteen cases, four perished.

SCOTT'S EMULSION

VERSUS

PLAIN COD LIVER OIL.

Plain Cod Liver Oil is indigestible, deranges the stomach, destroys the appetite, is not assimilated, and in a majority of cases is detrimental to the patient.

SCOTT'S EMULSION

Can be digested in nearly all cases, is assimilated, does not derange the stomach, nor overtax the digestive functions, and can be taken for an indefinite period when the plain cod liver oil cannot be tolerated at all, and with most marked results in *Anemia*, *Consumption* and all wasting conditions. It also contains the *Hypophosphites of Lime and Soda with Glycerine*, which are most desirable adjuncts.

WHEN PHYSICIANS TRY IT THEY INVARIABLY USE IT in preference to the plain cod liver oil or other so-called *Emulsions* that invariably separate, and hence their integrity and value is destroyed. *Scott's Emulsion* is palatable and absolutely permanent, hence its integrity is always preserved.

CHERRY MALT PHOSPHITES.

A combination of the tonic principles of *Prunus Virginiana*, Marbled Barley, Hypophosphites of Lime and Soda, and Fruit Juices. An elegant and efficient brain and nerve tonic. Send for samples of above—delivered free.

SCOTT & BOWNE, 132 South Fifth Ave., NEW YORK.

An Improved
Cantharidal
Plaster

The First and Only
Perfect
Vesicant



QUICK AND PAINLESS
Blisters in
Half the Time
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"Hints on
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Aloin 1-4 gr.
 Strychnine 1-60 gr.
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 Ipecac 1-16 gr.

FOR
**Habitual
 Constipation,
 Atonic
 Dyspepsia**

**LAPACTIC
 PILLS**
 S. & D.'s

Superiority of this Pill
 has induced
Many Imitations
 Specify S. & D.'s

**Biliary
 Engorgement
 AND
 Gastric
 Disorders**

LAPACTIC PILLS

A combination introduced by us and found in practice to possess superior advantages over other similar formulæ. The well-known mild action of Aloin on the lower portion of the intestinal canal, and its power of stimulating the hepatic functions, is supplemented by the action of Ipecac as a stomachic tonic, and by increasing the gastric secretions, the Belladonna acts specially upon the involuntary muscular fibres of the bowels, increasing peristalsis, diminishing the harshness, and at the same time increasing the effectiveness of the laxative. The general tonic effect of the Strychnine upon the stomach and bowels, and its direct action upon the sympathetic, make it a valuable addition in the permanent cure of

HABITUAL CONSTIPATION AND ATONIC DYSPEPSIA

Since we first called attention to our Lapactic Pills—some four years ago—publishing the composition of the same, a number of manufacturers have adopted the same formula, and have furnished these pills under the same name. Should Physicians fail to obtain satisfactory results from Lapactic Pills not of our make (and we have received a large number of such complaints from physicians by letter), we shall be glad to furnish a sample of our Lapactic Pills on application. We feel confident that they will fully substantiate our claims.

Please use the term "Lapactic Pills, S. & D.'s." when prescribing these pills.

SHARP & DOHME,

MANUFACTURERS OF

STANDARD MEDICINAL FLUID AND SOLID EXTRACTS; SOLUBLE HYPODERMIC TABLETS; SOLUBLE GELATINE AND SUGAR-COATED PILLS AND GRANULES; GRANULAR EFFERVESCENT SALTS; COMPRESSED LOZENGES AND TABLETS; FINE CHEMICALS, &c.

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It is advertised exclusively in medical journals.

HYDROLEINE.

(HYDRATED OIL.)

Produces rapid increase in Flesh and Strength.

FORMULA.—Each Dose contains.

Pure Cod Liver Oil.....40 m. (drops)	Soda.....1-3 Grains
Distilled Water.....35 "	Salicylic Acid.....1-4 "
Soluble Pancreatin.....3 Grains.	Ityocholic Acid.....1-10 "

Recommended and Prescribed by
EMINENT PHYSICIANS Everywhere.
It is pleasant to the Taste and
acceptable to the most delicate Stomach.

IT IS ECONOMICAL IN USE AND CERTAIN IN RESULTS.

HYDROLEINE (Hydrated Oil) is not a simple alkaline emulsion of oleum morrhuae, but a hydropancreated preparation, containing acids and a small percentage of soda. Pancreatin is the digestive principle of fatty foods, and in the soluble form here used, readily converts the oleaginous material into assimilable matter, a change so necessary to the reparative process in all wasting diseases.

The following are some of the diseases in which **HYDROLEINE** is indicated:

Phthisis, Tuberculosis, Catarrh, Cough, Scrofula, Chlorosis,

General Debility, etc.

TO BRAIN WORKERS of all classes, **HYDROLEINE** is invaluable, supplying as it does, the true brain-food, and being more easily assimilated by the digestive organs than any other emulsion.

The principles upon which this discovery is based have been described in a treatise on "The Digestion and Assimilation of Fats in the Human Body," and "Consumption and Wasting Diseases," by two distinguished London physicians, which will be sent free on application.

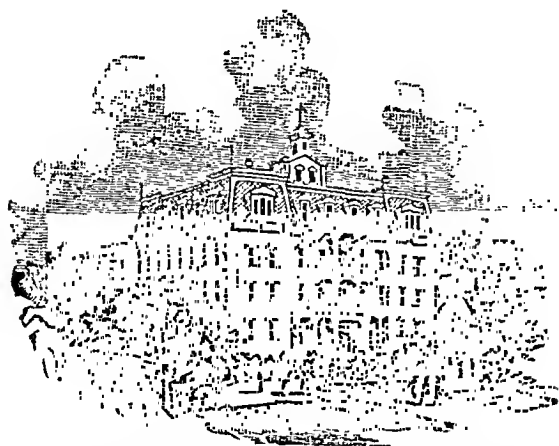
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BURN BRAE

A PRIVATE HOSPITAL

FOR MENTAL & NERVOUS DISEASES.

*Founded by the late Robert A. Given,
M. D., in 1859.*

Extensive and beautiful grounds. Perfect privacy. A pleasant, safe and healthful home. Music, games, open-air amusements. The oldest institution of the kind in the United States. Both sexes received.

ARRANGEMENTS MADE FOR CHRONIC CASES.

Located a few miles west of Philadelphia, at Primos Station, on the P. W. & B. Railroad.

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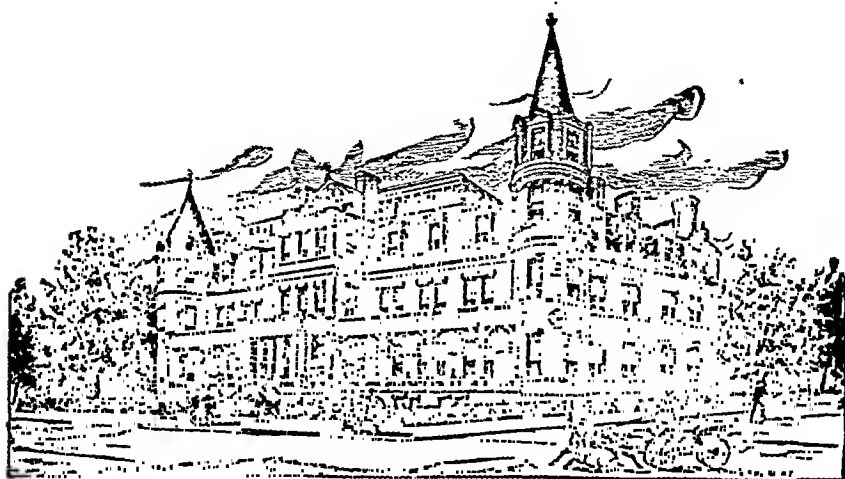
Resident Physicians: J. WILLOUGHBY PHILLIPS, M. D., S. A. MERCER GIVEN, M. D.

For further information address

BURN BRAE, Clifton Heights, Delaware Co., Pa.

Dr. William A. Hammond's Sanitarium,

WASHINGTON, D. C.



This Institution, which was opened on the 7th of January, 1889, has met with a degree of success altogether unexampled in the history of private hospitals. Though little more than two years have elapsed since its inauguration, nearly four hundred patients afflicted with

DISEASES OF THE NERVOUS SYSTEM

Have been treated within its walls. In consequence of the acquired experience, showing the advisability of such a course, arrangements have been made to enlarge the scope of the Sanitarium by establishing two additional departments—one for the Diseases peculiar to Women, and one for the Diseases of the Throat and Nose. The department of

DISEASES OF WOMEN

Will be under the immediate charge of Dr. E. L. TOMPKINS, who, as house physician and surgeon of the New York Post-Graduate Medical School and Hospital, and as one of the physicians of the Gynecological Department of the Demilt Dispensary, New York City, and further, during his service of two years as resident physician of the Hammond Sanitarium, has acquired large experience in Gynecological Medicine and Surgery. The department of

DISEASES OF THE THROAT AND NOSE

Will be under the immediate management of Dr. AMORY CHAPIN, whose special education in the Medical Schools and Hospitals of Vienna, Paris, London and New York, during which time he had every facility for observing and treating cases of Throat and Nose Disease, is a guarantee of his qualifications.

Dr. Hammond's experience during many years has convinced him that most diseases embraced within the above-named classes can be managed much more successfully in an institution of this kind, under the constant supervision of the physician, and with the aid of means not otherwise at command, than when the patients are seen by their medical advisers at intervals of several hours or days.

The SANITARIUM is situated on Columbia Heights, at the corner of Fourteenth street and Sheridan avenue. The position is the highest in the immediate vicinity of Washington, the soil is dry, and all the surroundings are free from noxious influences. It is readily reached by the Fourteenth Street Railway, the cars of which run almost to the doors. The building is very large, and as perfect in structure and arrangement as is possible from a knowledge of sanitary science and of the requirements of such an institution. It accommodates about thirty patients. So far as the rooms, table, etc., are concerned, they are equal to such as exist in the best hotels of our large cities. Electricity in all its forms, baths, douches, massage, inhalations, nursing, etc., are provided as may be required by patients, in addition to such other medical treatment as may be deemed advisable.

A large Solarium for sun-baths and exercise in cold or inclement weather, and heated with steam in winter, is constructed on top of the main building. Each patient is thoroughly examined by Dr. Hammond, and receives his daily personal attention.

For further information, Dr. HAMMOND can be addressed at the

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Fourteenth Street and Sheridan Avenue,

WASHINGTON, D. C.

TO PHYSICIANS

Desiring to send patients away from Home for Change of Scene, in
Connection with Systematic Regimen and Oversight,



THE JACKSON SANATORIUM

Dansville, Livingston Co., New York,

Offers exceptional advantages. It is the leading and most completely equipped *Health Institution* in America. Managed by physicians, graduates of *Regular Colleges*, who have at their command the best therapeutic appliances and conditions. Turkish, Molière, Thermo-Electric, and all forms of Baths; also Electricity (Galvanic, Faradic and Static), Massage, Taylor's Swedish Movements, etc., scientifically administered. Extensive apartments for treatment arranged for individual privacy. Skilled attendants

Hillside location in Woodland Park, 1200 feet above sea level, overlooking charming upland and valley views of Genesee region. Pure spring water from rocky heights. Clear, dry atmosphere, free from fogs and malaria. Perfect drainage and sewerage systems.

Elegant (brick and iron) FIRE-PROOF Main Building; also twelve cottages, all steam-heated and designed to meet every requirement of invalids or seekers of rest and quiet. A liberal and wholesome table.

Comfort without care; freedom from the taxations of fashionable life, and from the excitements and temptations of popular resorts. Especial provision for quiet and rest; also for recreation, amusement and regular out-door life.

Telegraph, Telephone, Electric Bells, Safety Elevator, and all modern appliances for comfort and health.

Autumn and Winter months the most favorable for treatment.

References to physicians if desired.

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J. ARTHUR JACKSON, Sec'y,

Formerly Jackson & Leffingwell.

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BROMIDIA

THE HYPNOTIC.

FORMULA.—

Every fluid drachm contains fifteen grains EACH of Pure Chloral Hydrat. and purified Brom. Pot. and one-eighth grain EACH of gen. im. ext. Cannabis Ind. and Hyoscyam.

DOSE.—

One-half to one fluid drachm in WATER or SYRUP every hour, until sleep is produced.

INDICATIONS.—

Sleeplessness, Nervousness, Neuralgia, Headache, Convulsions, Colic, Mania, Epilepsy, Irritability, etc. In the restlessness and delirium of fevers it is absolutely invaluable.

IT DOES NOT LOCK UP THE SECRETIONS.

PAPINE

THE ANODYNE.

PAPINE IS THE ANODYNE OR PAIN-RELIEVING PRINCIPLE OF OPIUM, THE NARCOTIC AND CONVULSIVE ELEMENTS BEING ELIMINATED. IT HAS LESS TENDENCY TO CAUSE NAUSEA, VOMITING, CONSTIPATION, ETC.

INDICATIONS.—

Same as Opium or Morphia.

DOSE.—

ONE FLUID DRACHM—(represents the Anodyne principle of one-eighth grain of Morphia).

IODIA

THE ALTERATIVE AND UTERINE TONIC

FORMULA.—

Iodia is a combination of active principles obtained from the Green Roots of Stillingia, Helonias, Saxifraga, Menispermum and Aromatics. Each fluid drachm also contains five grains Iod. Potas. and three grains Phos. Iron.

DOSE.—

One or two fluid drachms (more or less as indicated) three times a day, before meals.

INDICATIONS.—

Syphilitic, Scrofulous and Cutaneous Diseases, Dysmenorrhea, Menorrhagia, Leucorrhœa, Amenorrhœa, Impaired Vitality, Habitual Abortions and General Uterine Debility.

SPECIFY "BATTLE" WHEN PRESCRIBING OUR PREPARATIONS.

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A PHOSPHORIZED CEREBRO-SPINANT

(FRELIGH'S TONIC).

FORMULA.

Ten minims of the Tonic contain the equivalents (according to the formulæ of the U. S. P. and Dispensatory) of

Tinct. Nux Strychnus	- - - - -	1 minim.
" Ignatia Amara	- - - - -	1 "
" Cinchona	- - - - -	4 "
" Matricaria	- - - - -	1 "
" Gentian	- - - - -	1/2 "
" Colombo	- - - - -	1/2 "
" Phosphorus, C. P.	- - - - -	1-300 gr.
Aromatics	- - - - -	2 minims.

Dose: 5 to 10 drops in 2 tablespoonfuls of water.

INDICATIONS.

Paralysis, Neurasthenia, Sick and Nervous Headache, Dyspepsia, Epilepsy, Locomotor-Ataxia, Insomnia, Debility of Old Age, and in the treatment of Mental and Nervous Diseases.

One of the most widely known physicians in the country, residing in Washington, says:

"The elegance of the formula, the small dose required and its potency go far to recommend the Tonic to the profession in that large class of neuroses so common among brain workers in this country."

A well-known physician of Chicago, in practice since 1859, says:

"It will be a revelation to most physicians. I have found it peculiarly adapted to the mentally over-worked Public School teachers, as well as to the worn-out business man."

A Philadelphia physician says:

"Your Tonic is a noble remedy. Some of my patients call it 'The Elixir of Life.' In Atonic Dyspepsia and as an aphrodisiac it cannot be excelled."

A Baltimore physician, whose diploma dates from 1825, says:

"Your combination I find vastly more effective than any tonic I have ever used. It furnishes a most powerful evidence of the vastly increased power of medication by combination and judicious pharmaceutical preparation."

While an Ohio physician says:

"I have been in the profession since 1841, and must frankly say have never been much inclined to run after strange gods, but this new manipulation and combination pleases me."

The above and many similar letters from the profession can be examined at our office. Over 13,000 physicians in New England and the eastern Middle States are prescribing the Tonic regularly.

Price, One Dollar per bottle, containing 100 of the average 5-drop doses.

Physician's single sample delivered, charges prepaid, on application. That every physician may be his own judge of its value, irrespective of the opinions of others, we make the following

SPECIAL OFFER:

We will send to any physician, delivered, charges prepaid, on receipt of 25 cents, and his card or letter head, half a dozen physician's samples, sufficient to test it on as many cases for a week to ten days each.

The Tonic is kept in stock regularly by all the leading wholesale druggists of the country.

As we furnish no samples through the trade, wholesale or retail, for samples, directions, price lists, etc., address

I. O. WOODRUFF & CO.,
Manufacturers of Physicians' Specialties,

88 MAIDEN LANE, NEW YORK CITY.

GARDNER'S SYRUP OF HYDRIODIC ACID.

(HYDROGEN IODIDE.)

INTRODUCED IN 1878.

This is the original preparation of Syrup of Hydriodic Acid, first brought to the attention of the medical world in 1878 by R. W. Gardner, the use of which has established the reputation of Hydriodic Acid as a remedy.

Numerous imitations, prepared in a different manner, and not of the same strength, and from which the same therapeutic effects cannot be obtained, are sold and substituted where this Syrup is ordered. Physicians are cautioned against this fraud.

The seventh edition of Gardner's pamphlet, issued in October, 1889, containing seventy pages of matter devoted to this preparation, its origin, chemical characteristics, indications, doses and details of treatment, will be forwarded to any physician upon application, free of charge.

GARDNER'S CHEMICALLY PURE SYRUPS OF HYPOPHOSPHITES.

Embracing the separate Syrups of Lime, of Soda, of Potassa, of Manganese, and an Elixir of the Quinia Salt; enabling Physicians to accurately follow Dr. Churchill's methods, by which thousands of authenticated cases of Phthisis have been cured. The only salts, however, used by Dr. Churchill, in Phthisis, are those of Lime, of Soda and of Quinia, and always separately, according to indications, *never combined*.

The reason for the use of single Salts is because of antagonistic action of the different bases, injurious and pathological action of Iron, Potassa, Manganese, etc., in this disease.

These facts have been demonstrated by thirty years' clinical experience in the treatment of this disease exclusively, by Dr. Churchill, who was the first to apply these remedies in medical practice. Modified doses are also required in this disease; seven grains during twenty-four hours being the maximum dose in cases of Phthisis, because of increased susceptibility of the patient to their action, the danger of producing toxic symptoms (as hæmorrhage, rapid softening of tubercular deposit, etc.), and the necessity that time be allowed the various functions to recuperate, simultaneously, over-stimulation, by pushing the remedy, resulting in crisis and disaster.

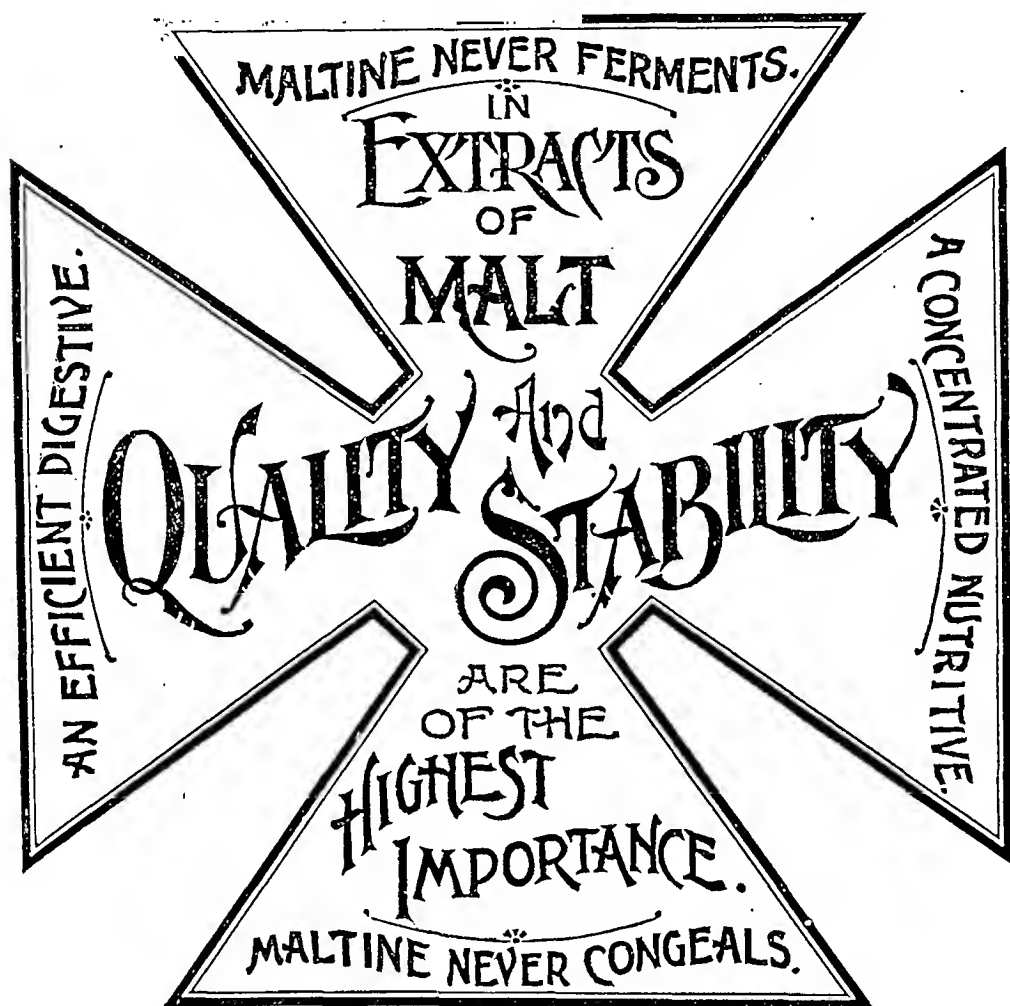
A pamphlet of sixty-four pages, devoted to a full explanation of these details and others, such as contra-indicated remedies, indications for the use of each hypophosphite, reasons for the use of *absolutely pure* Salts, protected in Syrup from oxidation, etc., mailed to Physicians without charge upon application to

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Maltine

An extract of Malted Barley, Wheat and Oats,
is the most Concentrated and Efficient, and
therefore the most Economical of all Malt Extracts.



IN Gastric Affections and Debilitating Diseases, so prevalent
during the Summer, Maltine with Pepsin and Pancreatine,
and Maltine with Phosphate Iron, Quinia and Strychnia will
be found exceptionally valuable, their base being a powerful
Reconstructive and Digestive.

An eight ounce bottle of each will be sent upon application to
any physician who will pay expressage.

The Maltine Manufacturing Co.

19 Warren Street, New York.

THE SCIENTIFIC USE OF THE HYPOPHOSPHITES.

Pulmonary consumption affords a fine example of a battle for life—between the blood corpuscles from within and the disease germs from without—with tissues sodden with catarrhal secretions as the battle field. It is a fact well demonstrated in the laboratory that pure rich blood is the most effective enemy to the germs of this disease.

THE FALLACY OF "TONICS."—It may now be taken as definitely settled that Iron, Potash, Manganese and other so-called tonics have a direct deleterious effect in this disease. Instead of stimulation, the organic system needs rest and regenerative food.

THE FALLACY OF THE PHOSPHATES.—A hypophosphite contains the smallest possible proportion of oxygen, its formula being $P O$ combined with the alkaline base. In the process of physiological assimilation it rapidly oxidizes, becoming successively a phosphite ($P O^2$ with the base) and a phosphate ($P O^3$ and the base) in which form it is deposited in the tissues. Thus the hypophosphites furnish food directly to the tissues and are at the same time the greatest oxidizers known to physiological chemistry. If, however, you administer the phosphates you give a substance that has already undergone the changes, and hence is an inert, dead substance—a refuse to be at once rejected by the system and cast out with the excretions.

It was Dr. Churchill, of Paris, who first demonstrated this fact, and established the curative power of the Hypophosphites of Lime and Soda in Consumption. All other treatment ultimately fails. This, followed faithfully and perseveringly, slowly but surely succeeds. By treating the consumptive patient and building up his vitality it enables him to overcome the disease.

IN THE TREATMENT OF NERVOUS DISEASES AND GENERAL DEBILITY this remedy demonstrates again its restorative powers. Here it is not the stimulating action of the remedies usually classed as tonics that is needed. The organic powers of the system are already taxed to their utmost ability to carry on the physiological processes of life. The Hypophosphites of Lime and Soda gives the much-needed effect in these conditions—not that of a stimulant by irritation, to be followed by a depressing reaction—but that of a true nutriment to the starving tissues. Its tonic effects are permanent as they are the effects of a richer blood supply, bringing healthy food and oxygen to the tissues. Thus the patient is gradually brought up to his normal condition.

IN CONVALESCENCE FROM ACUTE DISEASES this remedy should be used to insure rapid convalescence and to escape the liability to the establishment of chronic diseased conditions. As a ready oxygenator of the blood, and as a tonic and pure reconstructive of ill-nourished tissues, many other indications for its use will suggest themselves to the physician, following out the idea of its physiological action. Thus you can readily see the reasons for its efficacy in Rickets, Difficult Dentition, Marasmus, Wasting Discharges, Sexual Debility and many other diseases characterized by malnutrition or lowered vitality.

It is of the utmost importance to see that the pure Hypophosphites is obtained, as you see by the chemical formula given above that the deteriorated or oxidized salts are inert and are simply treated as so much waste matter in the system. In McArthur's Compound Syrup you have the Chemically Pure Hypophosphites of Lime and Soda, free from all poisonous drugs.

GYNECOLOGY.

 UNDER THE CHARGE OF

 HENRY C. COE, M.D., M.R.C.S.,
 OF NEW YORK.

ETIOLOGY AND PATHOLOGY OF FIBRO-MYOMA.

ENGSTRÖM (*Med. Anzeiger zur Centralblatt für Gyn.*, Aug. 1890) calls attention to the fact that heredity seems to play some part in the etiology of fibrous growths of the uterus (as shown by an analysis of the histories of several families in which he had observed that two or more sisters suffered from them), as had been previously pointed out by Winckel, Carl Braun, and Gusserow—a fact which seemed to prove Cohnheim's theory of their embryonal development.

BOISLEUX (*Ibid.*) examined ten specimens of fibroid uteri removed *in toto* by Martin, with special reference to the detection of microorganisms in the cervical endometrium. Sections were made through that portion of the cervix which usually forms the stump after supra-vaginal amputation. In four cases he found micrococci which produced rich cultures on gelatine plates, and caused death in mice and guinea-pigs which were inoculated with them.

 THE TREATMENT OF OVARIAN CYSTS BY FARADISM.

NOEGGERATH (*Ibid.*) reports six cases which were treated in this way from six to eight weeks, the tumor diminishing visibly in every instance and even disappearing entirely after a longer interval had elapsed. Proliferous multilocular cysts of moderate size are best suited for this treatment. The negative pole of the secondary current is introduced into the vagina (a sponge electrode being used), while the positive pole is attached to a large sponge electrode, which is placed on the abdomen. A current is used which is barely felt by the patient. Three *séances*, of half an hour each, are held weekly.

 VUILLET'S METHOD OF DILATING THE UTERUS.

VUILLET (*Ibid.*) claims the following advantages for his method: Dilatation may be carried so far that the interior of the uterus may be inspected, and it may be maintained as long as desired. Perfect drainage is secured, the endometrium is rendered directly accessible to local treatment, and morbid growths are more readily removed through the dilated cervix, while intra-uterine hæmorrhage is most effectively treated by tamponing the cavity after previous dilatation.

 EXTIRPATION OF THE BLADDER IN THE FEMALE.

PAWLİK (*Ibid.*) reports the following interesting case: The patient applied to his clinic on account of persistent hæmaturia. By catheterizing both ureters hæmorrhage from the kidney was excluded. Digital exploration of the bladder revealed the presence of a polypus the size of an almond, which

cannot be solved by analogies drawn from observations of other specific infections, such as anthrax and the septicæmias of the lower animals. The study of wound infections involves the consideration of many varying and often complicated factors, relating both to the agents of infection and to the individual exposed to infection.

Without consuming time with any historical review, I shall proceed at once to indicate some of the questions which are of especial importance, and which may be profitably considered in this discussion.

What are the microorganisms concerned in the infection of wounds, and how do they act?

How are we to explain the great differences in the effects produced by the pyogenic bacteria, their apparent harmlessness under some conditions, their fatal virulence in others?

What are the ways by which bacteria gain access to a wound?

How often are bacteria to be found in wounds treated antiseptically or aseptically? What are the characters of these bacteria and whence do they come?

What are the best means of surgical disinfection?

No attempt can be made on this occasion to treat exhaustively a single one of these questions. My aim will be to present a brief survey of our knowledge, as well as of the defects in our knowledge, concerning some of the more important questions; to offer some results of personal observation and experiment, and to indicate in conjunction with the Co-referee the lines which this discussion may follow. It does not seem necessary, indeed it would be presumptuous before this audience, to dwell in detail upon established facts which are the common property of all who are interested in the subject.

So far as personal observations and experiments are concerned, I may say that these have been made in the Johns Hopkins Hospital and Pathological Laboratory, and that I am indebted to several of my colleagues and co-workers there for work which they have done either independently or under my supervision. I take this opportunity of acknowledging especially the assistance of Drs. Halsted, Abbott, Ghriskey, Robb, and Howard.

This paper will relate only to the ordinary inflammatory and suppurative traumatic affections, and not to specific wound infections, like tetanus, diphtheria, and hospital gangrene.

It would be wearisome on this occasion to consider or even enumerate all the bacteria which have been found in suppurative and other traumatic inflammatory processes, so that in this connection I shall touch only upon a few points drawn chiefly from our own experience.

We have found the staphylococcus pyogenes aureus far more frequently than any other species of bacteria in furuncles, abscesses, osteomyelitis, and other forms of suppuration. The prevalence in Strassburg, accord-

CONTENTS.

ORIGINAL COMMUNICATIONS.

	PAGE
Conditions Underlying the Infection of Wounds. By WILLIAM H. WELCH, M.D.	439
Wound Infection: the Causes which Predispose to its Production, or Favor Immunity, and the Role of Antiseptic Agents. By ROSWELL PARK, A.M., M.D.	465
Two Cases of Pregnancy with Bright's Disease and Almost Complete Suppression of Urine. By G. ERNEST HERMAN, M.B. Lond., F.R.C.P.	485
Aseptic and Antiseptic Details in Operative Surgery. By ARPAD G. GERSTER, M.D.	495
The Pathology of Ophthalmoplegia. By W. J. COLLINS, M.S., M.D., B.Sc. Lond., F.R.C.S. Eng., and L. WILDE, M.D. Durham	512

REVIEWS.

The Peptones: Their Scientific and Practical Significance. Studies Toward the Knowledge of the Digestion of the Proteid Bodies and Gelatin	520
Text-book of Medical Jurisprudence and Toxicology. By John J. Reese, M.D.	521
The Modern Antipyretics: Action in Health and Disease. By Isaac Ott, M.D.	521
Lectures on Diabetes; including the Bradshaw Lecture delivered before the Royal College of Physicians, August 18, 1890. By Robert Saundby, M.D., F.R.C.P. Lond.	522
Practical Pathology and Morbid Histology. By Prof. Heneage Gibbes	523
Bacteria and their Products. By German Sims Woodhead, M.D. Edin.	523
The Latin Grammar of Pharmacy and Medicine. By D. H. Robinson, Ph.D.	524
A Manual of Diseases of the Nose and Throat, including the Nose, Naso-pharynx, Pharynx and Larynx. By Proctor S. Hutchinson, M.R.C.S.	525
Atlas of Clinical Medicine. By Byrom Bramwell, M.D., F.R.C.P. Edin.	525
Text-book of Hygiene. By George H. Rohé, M.D.	526

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

PAGE	PAGE
Salicylate of Sodium in the Treatment of Diabetes	527
The Treatment of Epilepsy by the Combined Use of Bromides and some Agent Capable of Producing Anæmia of the Nervous Centres	528
Antipyrine in the Treatment of Pleural Effusions	529
Death Under Methylene	529
A New Antiseptic	529
The Toxic Dose of Oil of Turpentine	530
A New Mode of Administering the Bromides	530
Peroxide of Hydrogen in Diseases of the Eye	530
The Methodical Employment of Sulphonal in Mental Diseases	531
Oxygen as a Distinct Remedy for Disease, and a Life-saving Agent in Extreme Cases	532
Diuretin	533
Death After Salol	534
Hypodermic Injections of Carbolic Acid in Acute Articular Rheumatism	534

viz., the invisible growth of all pathogenic streptococci upon potato. The behavior is usually as stated by Von Lingelsheim, but I have isolated from a case of phlegmonous cellulitis, and from one of septicæmia, a streptococcus presenting a distinct grayish-white growth upon potato. Von Lingelsheim made no use of one of our most valuable differentiating media, viz., sterilized milk colored with litmus. In this medium the common streptococcus pyogenes produces a very firm coagulum with separation of nearly colorless serum, as has been pointed out by E. Fränkel. I have from different sources isolated pathogenic streptococci which do not coagulate milk, although they change the color of the litmus to a lilac pink, indicating the production of a certain amount of acid.

While we must admit that all inflammatory affections caused by the pyogenic staphylococci may be produced also by streptococci, and, with the probable exception of erysipelas, the reverse also holds true, nevertheless we are not prepared to accept the statements of Levy and some other recent writers that the character of the microorganisms, whether staphylococci or streptococci, has no influence upon the symptomatology of the disease. In conformity with most investigators, we have found the staphylococci prone to form circumscribed areas of suppuration, whereas the pyogenic streptococci have a tendency to produce spreading phlegmons with lymphangitis and a wide zone of surrounding redness and inflammatory œdema. It is the custom in our gynecological wards to isolate the operative cases in which streptococci are found at the time of the operation in the seat of the disease, or subsequently in the wound.

Of other pyogenic cocci we have found the staphylococcus pyogenes citreus twice in abscesses; the staphylococcus cereus albus three times in combination with other bacteria in suppurating wounds, the diplococcus pneumoniae once in a fibrinous peritonitis, and the micrococcus tetragenus once, together with the staphylococcus aureus in an abscess of the lung.

The list of bacilli which may be concerned in suppurative and other inflammatory affections is much longer than was formerly supposed, and is likely to be still further extended. Those which we have chanced to encounter are: the bacillus pyogenes foetidus, twice in abscesses containing bad-smelling pus; the proteus Zenkeri, once in pure culture in an ovarian abscess with purulent salpingitis; a bacillus apparently identical with the bacillus emphysematis maligni of Wicklein, once in an emphysematous cellulitis of the arm; a bacillus apparently identical with the bacillus enteritidis of Gärtner, in the brain and other organs of an infant three months old with cerebral abscess and meningitis following operation for imperforate anus; the typhoid bacillus, once in pure culture in an osteomyelitis of the ribs following typhoid fever: a hitherto undescribed bacillus, rapidly liquefying gelatin and characterized by rapid solution or peptonization of milk, without coagulation, once in peritonitis; bacilli

ing to Levy, of the *staphylococcus pyogenes albus* in all kinds of suppurative inflammation (excepting furuncles), raises the question whether there may not be differences in different regions as regards the relative frequency of the various kinds of pyogenic cocci.

We have, however, met a white *staphylococcus* in a certain class of cases with great frequency, viz., in small stitch abscesses, and in the slighter grades of inflammatory disturbance of wounds treated antiseptically or aseptically. This coccus has been often seen by Bossowski and others in the same class of wounds, and has been hitherto identified with the *staphylococcus pyogenes albus* of Rosenbach, but we have some hesitation in so regarding the micrococcus which we have found in the cases mentioned. The *staphylococcus pyogenes albus* is generally described as not differing essentially from the *aureus*, except by the absence of the yellow color in the cultures. This coccus, however, differs from the *staphylococcus pyogenes aureus* in much greater slowness of liquefaction of gelatin and of coagulation of milk, and in far less virulence when inoculated into the circulation of rabbits. It may be an attenuated form of the *staphylococcus pyogenes albus*. Until this is settled I propose to call it the *staphylococcus epidermidis albus*, as it is an almost constant inhabitant of the epidermis, as will be apparent when I come to speak of the bacteria in aseptic wounds. I shall only add here that this coccus may be present in graver suppurative inflammations, but then it has been nearly always associated with some other pyogenic organism, or has assumed the form of the typical *staphylococcus pyogenes albus*.

It is, perhaps, not out of place to remark that the diagnosis of the *staphylococcus pyogenes albus* in cultures from abscesses and other suppurations should not be made too hastily. It may require several days before colonies of the *aureus* assume a distinct yellow color. Cultures upon potato are particularly favorable for the speedy development of this color. There may be marked differences in the rapidity with which different colonies of the *aureus* from the same source and in the same plate or roll cultures turn yellow.

The efforts to differentiate into distinct species the pathogenic streptococci have thus far met with little success, so that the weight of opinion favors the view that the streptococci of erysipelas, of phlegmonous inflammation, of septicæmia, of puerperal fever, and of various forms of angina, belong to one and the same species. In conformity with the results of most investigators I have been unable to determine any decisive differences between the *streptococcus erysipelatus* and the *streptococcus pyogenes*. Von Lingelsheim has recently divided the streptococci into two groups: one non-pathogenic, called the *streptococcus brevis*, and the other pathogenic, the *streptococcus longus*. Among the points of distinction which he gives there is one which I have not found constant,

For the purposes of the present discussion, perhaps the chief interest of our observations concerning the colon bacillus is that they furnish an illustration of the possible predisposition to infection afforded by intestinal lesions, and also give an example of the much-disputed auto-infection.

Of suppurative inflammations which we have examined bacteriologically with negative result, may be mentioned abscesses in which the bacteria were presumably dead, several hepatic abscesses caused by the amœba dysenteriae, and many cases of suppurating buboes and of pyosalpinx, doubtless caused by the gonococcus.

From the foregoing brief summary, mainly of our own limited experience, it is clear that the bacteria which may be concerned in surgical infections are many, but the pyogenic cocci of Ogston, Rosenbach, and Passet far out-rank in frequency, and therefore in importance, all other bacteria combined.

In view of the more practical matters to be considered, we cannot tarry long over the theories of suppuration, interesting as just this part of the subject is at the present time.

There are very good reasons to believe that the process of suppuration serves a useful purpose, and is one of the most important and efficient weapons employed by Nature in combating invading microorganisms. Man is not subject to those forms of septicæmia, common in many lower animals, in which enormous numbers of bacteria are present in the blood; but, on the other hand, he is particularly subject to suppurations and other localized inflammations. The same microorganism, for instance the diplococcus pneumoniae and the bacillus anthracis, which produces in many of the lower animals the form of septicæmia mentioned, causes in man localized inflammations. In the experimental septicæmias of lower animals there is an unmistakable relation between the extent of the local reaction at the point of inoculation on the one hand, and the duration of life and number of organisms present in the blood on the other. The more extensive and intense the local reaction, the fewer, as a rule, are the bacteria found in the blood and the longer the duration of life. There are two varieties of the swine-plague bacillus, the one kills rabbits in twelve to eighteen hours with trifling local reaction and a large number of bacilli in the blood, the other produces extensive purulent infiltration around the site of subcutaneous inoculation and permits the animals to live for several days, and at the autopsy very few bacteria are found in the blood. In a susceptible animal the virulent anthrax bacillus produces an acute septicæmia, the attenuated bacillus a local abscess. There is even experimental evidence that if inoculation of a susceptible animal with the virulent anthrax bacillus be speedily followed by inoculation at the same point with a pyogenic organism so that suppuration soon ensues, the development of anthrax

which could not be cultivated in our ordinary culture media, in three cases of suppurative inflammation; and the *bacillus coli communis*, fifteen times.

As these bacillary infections are far less common than those caused by micrococci, I shall take some other occasion to describe them, and here shall ask your attention only to one group, viz., those associated with the *bacillus coli communis*, as they have been relatively common in our experience and present some points of especial interest.

The first observation of the *bacillus coli communis* in connection with wound infection was made by Tavel, in 1889. This has been followed by a few isolated observations of this organism either in the unchanged organs of the body or in abscesses, until recently A. Fränkel reports its presence in nine out of thirty-one cases of peritonitis. I first came across this bacillus in the organs of the body in 1889, in a case of multiple fat-necrosis with pancreatitis, which I reported to the Association of American Physicians. As in this case diphtheritic colitis existed, it seemed probable that the lesion of the intestine opened the way for the entrance into the circulation of this inhabitant of the healthy intestinal canal. This view subsequent experience has confirmed, for I have already isolated in pure culture from the internal organs the *bacillus coli communis* in twenty-five autopsies where some distinct lesion of the intestinal mucous membrane existed, such as ulceration, diphtheritis, hemorrhage, traumatic injury, and I have almost uniformly failed to find it outside of the intestine when no demonstrable lesion of the mucous membrane existed. I am therefore prepared to say that this bacillus is an extremely frequent invader in intestinal disease, although I have no evidence to offer that it does any harm except under certain especial conditions. The autopsies were in nearly every case made within three or four hours after death, once in less than one hour. Moreover, the colon bacillus does not invade the blood and organs in the process of post-mortem decomposition.

The cases in which we have found the colon bacillus under circumstances pointing to its pathogenic action have been as follows: perforative peritonitis, four cases; peritonitis secondary to intestinal disease without perforation, two cases; circumscribed abscess, three cases; and laparotomy wounds, six cases.

Its presence, several times in pure culture, in laparotomy wounds treated aseptically, although apparently not a source of serious trouble, was not a matter of indifference. It was generally accompanied with moderate fever and a thin, brownish, slightly purulent discharge, of somewhat offensive, but not putrefactive odor. The smooth and rapid healing of the wound was interfered with. In some of the cases there was evidence of intestinal disorder; in others this was not apparent, and infection from without could not be excluded.

How are we to explain the extraordinary variability in the effects produced by the pyogenic cocci? The specific infectious agents with which we first became familiar, the bacteria of the natural and of the experimental septicæmias of lower animals, are nearly constant in the effects which they produce when inoculated in small quantity into susceptible animals. Not so with the pyogenic cocci. Here we meet the most puzzling differences. We find the same coccus in the most insignificant epidermal pustule which we find in a dangerous phlegmon, in osteomyelitis, in pyæmia, in septicæmia, in acute ulcerative endocarditis. The manifold varieties of puerperal fever, which we now know to be a typical wound infection, may be caused by apparently the same streptococcus, producing a mild endometritis, a pelvic abscess, localized or general peritonitis, pyæmia or the most virulent and rapidly fatal septicæmia.

If we seek an explanation of these things by experimentation upon animals, we find that in order to get any positive effects at all it is often necessary to introduce enormous quantities of our cultures, containing vastly more bacteria than we can suppose to be concerned in the primary infection in human beings. If we inoculate smaller quantities, these can often be disposed of by the animal without any manifest symptoms.

It must be confessed that we stand here before problems many of which still await solution, but it will not do to pass them by on this occasion without some discussion, although time will permit me to touch upon only some of the salient points.

It is well to bear in mind that the inflammatory infections of wounds do not represent specific morbid entities in the same sense as do anthrax and typhoid fever, for example. The latter diseases are caused by a single specific germ and no other, and present a definite and characteristic clinical and anatomical picture, whereas the former correspond to the reaction of the body toward a great variety of noxæ and offer manifold variations in symptoms and lesions.

The quantity of a culture of the staphylococcus aureus required to produce suppuration is not the same for all tissues and all parts of the body. A mere trace, a fraction of a drop, of a dilute suspension of the yellow staphylococcus in salt solution when injected into the rabbit's eye will set up a suppurative inflammation. It takes a larger amount of such a suspension to produce an abscess in the loose subcutaneous tissue of the back than in the dense tissue of the ear of a rabbit. Enormous quantities, five to ten cubic centimetres and more, of the suspension can be injected often without effect into the normal peritoneal cavity of rabbits and dogs, as has been shown by the well-known experiments of Grawitz and his pupils, confirmed by several other investigators.

septicæmia may be warded off and the animal recover. It seems reasonable to infer, when the same organism produces in one animal a rapidly fatal septicæmia without local reaction and in another species only a local abscess, that the latter animal is protected by the barrier of suppuration. As is well known, the fatal infections from wounds received at post-mortem examinations are not generally those where marked local reaction with suppuration appears at the seat of the often trifling injury.

Exactly how abscess formation checks the invasion of bacteria we do not know. That bacteria may die, often in a short time, in pus both within and outside of the body, has been demonstrated. The leading theories are these: leucocytes and other cells act as phagocytes, taking into their bodies the bacteria and killing them; the wall of leucocytes and other cells at the margin of an abscess acts as an obstacle to the passage of the bacteria into the surrounding tissues; pus contains chemical substances injurious to bacteria or antidotal to their toxic products; the bacteria starve in pus, not being able to assimilate such concentrated food. Something can be said in favor of each of these theories, more in favor of some than of others; but none is proven and we cannot stop to discuss them here.

That pyogenic bacteria set up suppuration by chemical substances produced by them, seems to be proven. The zone of necrosis around these bacteria which can be demonstrated as the first effect of their lodgment in the tissues points to such chemical action. Moreover, from cultures of pyogenic cocci several chemical products have been obtained capable of causing suppuration. The most interesting observations here are the recent ones of Buchner and his pupils, who have found the proteid constituents of many bacteria capable of producing suppuration. These bacterio-proteins of Buchner possess in a remarkable degree the property of positive chemotaxis, that wonderful quality by which certain chemical substances influence the leucocytes to migrate from the vessels and move actively toward them. A flood of unexpected light seems destined to come from the studies of chemotaxis to illumine many dark problems in pathology.

Since we know that the chemical products and constituents of certain bacteria are the direct agencies in the production of suppuration, it is less surprising to find that various other chemical substances are likewise able to cause suppuration. But important as this fact is for the theory of suppuration, the demonstration that these other chemical irritants, such as turpentine, nitrate of silver, etc., can cause suppuration has no especial bearing upon the ordinary suppurations in human beings.

We come now to the consideration of a division of our subject beset with difficulties at every turn, but one no less interesting to the surgeon than to the bacteriologist.

Our conclusions from these experiments are that while variations in virulence occur and may explain in large part the varying results of different experimenters operating upon animals under similar conditions, they are not sufficient in degree or in frequency to afford adequate explanation of the great differences in the effects of the pyogenic cocci upon human beings, or at least can do so only in part.

How far can we apply to human beings the experiments showing the great tolerance of animals toward the pyogenic cocci? The experimental evidence upon this point is naturally scanty, but such as we possess indicates that man is not equally tolerant, that his tissues respond more readily by suppuration to inoculation of pyogenic cocci. The experiments upon this point of Garré, Bumm, Bockhart, Fehleisen, Waterhouse—and these names should not be mentioned without expressing the debt of gratitude which science owes to them—are too well known to necessitate here any statement of their results. But while these experiments appear to indicate less immunity on the part of human beings toward the ordinary staphylococci of suppuration—a matter, however, which cannot be considered absolutely certain—they have also demonstrated that the difference, if it exists, is only one of degree, and that large numbers of the pyogenic cocci may be inoculated into human tissues without effect. Waterhouse, for example, injected under the skin of the abdomen and of the scrotum 0.25 c.c. of a suspension of the staphylococcus aureus, made by mixing one loopful from an agar culture with 5 c.c. of water, and the result was completely negative.

It is true that undue emphasis should not be laid upon the negative results, for there are equally trustworthy experiments with positive result, showing that even small quantities of suspensions of the pus organisms may cause suppuration, both in animals and in human beings.

That there exist bacteria capable of producing abscesses regularly, even when inoculated in very small quantity into animals, is proven by the discovery by Dr. Bolton of a hitherto undescribed bacillus in garden earth. This bacillus, for cultures of which I am indebted to Dr. Bolton, who will hereafter publish its description, produces with certainty localized abscesses when inoculated in small amount into the subcutaneous tissues of rats, mice, and rabbits. When injected into the circulation it causes multiple abscesses in the kidneys, joints, bones, and other situations.

Inasmuch as it is by their toxic products that the pyogenic bacteria do injury, it is not surprising to find that it makes a great difference in the result whether these bacteria enter the tissues already equipped with a reserve force of this poisonous material, or must begin the fight unarmed. There is abundant experimental evidence to show that even

It is probable, as claimed by Grawitz, that this difference in the behavior of different tissues depends in large part upon the rapidity with which the injected material, more particularly the toxic substances, are absorbed. But we must also reckon with a predisposition apart from this in the normal tissues, for the introduction even of very large numbers of staphylococci into the circulation of rabbits is followed by the formation of abscesses only in certain situations, mainly the kidneys, heart and certain muscles, although we must suppose that the cocci have been carried to all parts of the body.

That there are variations in the virulence of different cultures of the pyogenic cocci is admitted by most writers and may be inferred from the discrepant results of various experimenters as regards the amount of the culture required to produce suppuration. These discrepancies cannot be explained wholly by different conditions of the experiments. We have found no especial difference in the result, for example, whether we introduced into the peritoneal cavity of dogs cultures of the staphylococcus aureus according to Grawitz's method, or according to Pawlowsky's method, or by a small laparotomy wound. By one as well as by another method we were able to inject 5 c.c. and often more of a suspension in salt solution of the yellow staphylococcus without any appreciable effect.

In order to test this matter of varying virulence, I have injected into the ear-veins of rabbits bouillon cultures, forty-eight hours old, of the staphylococcus aureus obtained from many different sources. Considerable variations in virulence were found to exist both in the original cultures and in the successive generations of the same culture. The most virulent culture was one from a beginning furuncle. The injection of 0.1 c.c. of this culture caused the death of the rabbit in twenty-four hours with a large number of staphylococci in the blood and many necrotic foci in the kidneys. After the second generation the virulence was lessened. From a case of hypertrophic cirrhosis of the liver without suppurative complications a moderate number of colonies of the staphylococcus pyogenes aureus were found in cultures made from the liver. 1.5 c.c. of bouillon cultures, forty-eight hours old, of this staphylococcus were injected without any effect into the ear-veins of two rabbits, the animals being still alive eight months after the injection. These extremes are met only exceptionally. In the great majority of cases we have found the injection of 0.2 to 0.3 c.c. of bouillon cultures sufficient to kill the animal in four to seven days with the usual abscesses in the kidneys and heart and occasionally elsewhere. As a rule there was no material change in the degree of virulence for many successive generations, but sometimes without any apparent cause there would occur a marked weakening of the virulence either after a few generations or after many.

was removed per vaginam through an incision, its base being thoroughly cauterized. The patient was discharged cured. A year later she returned, extremely anæmic, stating that after enjoying good health for eight months the hæmaturia returned and had never ceased. Through the endoscope a diffuse papillomatous growth was seen, portions of which were removed for microscopical examination and proved to be malignant. The writer determined to extirpate the entire bladder, after turning the ureters into the vagina, in order to form a new bladder from the latter and the remains of the urethra. The preliminary operation was performed by inserting metallic catheters into both ureters (the patient being in the knee-elbow posture), incising the vagina opposite to the terminal extremity of each ureter, dissecting out the duct, and then ligating and dividing it two-fifths of an inch from its opening into the bladder. The cut end of each ureter was then stitched into the corresponding vaginal wound after removing the catheter; after healing had occurred there were thus formed two uretero-vaginal fistulæ. Three weeks later the radical operation was performed. An incision was made as for suprapubic lithotomy, the peritoneum was dissected from the bladder, and the latter was separated from its attachments as low down as the urethral opening, the organ having been previously distended with an iodoform emulsion in order to render it more prominent. At this stage the bladder was emptied and the cavity already made was packed with iodoform gauze on account of the oozing. The anterior vaginal wall was now incised just above the most prominent part of the urethro-vaginal septum, the bladder was drawn down through the wound and was cut away at the vesical orifice of the urethra. Here the patient collapsed, but was revived by the subcutaneous injection of ten ounces of warm salt solution, and the operation proceeded. The anterior vaginal wall was sutured to the anterior border of the urethral wound, the posterior border being united to a freshened surface at the entrance of the vagina in such a way as to produce a kolpokleisis. Before the sutures were tied elastic catheters were introduced into the urethra and carried into the ureters. The abdominal wound was closed, except at its lower end, through which were carried the ends of the gauze for drainage. The patient made a good recovery, but a fistula remained which communicated with the cavity that had formerly been occupied by the bladder, which did not heal for eight months. A second unsuccessful attempt at kolpokleisis was made ten months after the primary operation. This was repeated a month later, the anterior and posterior walls being united transversely; a minute fistula remained behind the urethra, through which urine escaped only when the patient was in an erect posture. She was able to retain control of her artificial bladder until twelve ounces of urine had accumulated, when she could empty it by contracting the perineal muscles. The woman made a perfect recovery and was able to undertake a journey from Prague to Berlin and to spend several days in sight-seeing.

[This remarkable case is certainly a triumph of plastic gynecological surgery, before which others sink into insignificance. The practical application of Professor Pawlik's long and patient experiments in catheterization of the ureters proves that this manœuvre is something more than a scientific pastime. The boldness of the conception and the untiring patience of the operator awaken our highest admiration.—ED.]

in very small number the pus-producing micrococci will cause suppuration if they are accompanied, or soon preceded or followed, in sufficient amount and concentration by various toxic substances which are present in pure cultures of the cocci, and the extent of the inflammation bears a relation to the quality and quantity of these substances. The experiments and researches of many investigators, such as Hankin, Brieger and Fränkel, Buchner, Dirckinck-Holmfeld, Grawitz, Leber, Dubler, Kronacher, Ribbert, have shed light upon this subject. It would seem as if the issues of the battle between the invading micrococci and the tissues depend often upon the first blow; and if the invader can strike this with the aid of powerful weapons which he has forged before he enters, the victory, for the time at least, is with him.

This matter of accompanying toxic substances is probably of great importance in our understanding of the potentialities of the living agents of wound infection as they occur under natural conditions. Here we have to do, not with pure cultures of the pyogenic cocci, still less with those that have been washed in sterilized salt solution or water, but with pus-producing organisms which have come from all sorts of sources, which have been engaged in very different activities, which have been growing under various conditions or have been long dormant, and which are mixed with many kinds of bacteria. There is proof that under some of these conditions the infectious material may possess a degree of virulence with which we are not familiar in our artificial cultures. When a strong, healthy man (I have now in mind such a case in a medical student) dies in a few days from septicæmia caused by the inoculation of a mere scratch on the finger with fluid from a puerperal peritonitis, it is the quality of the infectious material which brought about the fatal result, and not any especial predisposition of the individual. When we find, as has been done, that the peritoneal fluid contains in pure culture the streptococcus pyogenes, and that the same organism is present in pure culture in the patient accidentally infected with this fluid, the observation is just as convincing and clear in its interpretation as if the experiment had been made intentionally upon an animal. No number of experiments showing that millions of apparently the same species of micrococcus can be injected in artificial cultures into the peritoneal cavity of dogs and rabbits can do away with the force of such an observation. No surgeon, no obstetrician, however strong may be his trust in the germicidal power of the animal tissues and fluids, would willingly permit the smallest particle of that peritoneal fluid to come into contact with a fresh wound or the uterus after childbirth.

The differences in virulence which have been found to exist between inflammatory exudates from various sources containing pyogenic bacteria are much greater than those observed in the cultures of the same bacteria on artificial media. To explain this, some assume that the differences in

virulence pertain to the pyogenic cocci as such, that they are specifically endowed with different biological attributes; while others think that the varying virulence relates not so much to the bacteria as to the character of the toxic substances with which they are associated. In favor of the latter view, which is the one advocated by Bumm, Fehleisen, Chantemesse, and others, may be cited such observations as that of Bumm, who found that the injection into the peritoneal cavity of a rabbit of a quarter of a drop of fluid from a case of acute septic puerperal peritonitis quickly killed the animal with peritonitis, whereas the streptococci artificially cultivated from the same fluid were much less virulent; or the experiment of Fehleisen, showing that a minimal quantity of an artificial culture of the staphylococcus aureus added to a little of the clear serum obtained from the germ-free zone of inflammatory œdema around a spreading cellulitis was capable of producing extensive abscesses, whereas the mixture of the same organism with water had no such effect. The question is still an open one, and very likely both factors are concerned.

We have thus far confined our attention to the microorganisms of infection, and have said nothing concerning the conditions predisposing to infection in the exposed individual. Everybody believes in the doctrine of predisposition, some more than others. The tendency at the present time is certainly not to minimize its importance. Predisposition is a term to conjure with. It is often made to explain in a vague sort of way things which we do not understand. Nevertheless it is a very real thing, and we cannot pass it by here without notice, even if this must necessarily be very brief. Every surgeon knows that wounds in some persons do much better than in others, and that some kinds of wounds are much more prone to suppurate than others.

The interesting studies upon immunity which have shed so much light upon the nature of predisposition toward some infectious diseases have not as yet cleared up the question of immunity against the pyogenic cocci. We know that the healthy tissues can dispose of a certain number of these cocci under ordinary circumstances, but how they do it we do not know.

An experiment of Roger is suggestive. He found that the streptococcus of erysipelas grew as well in the blood-serum of rabbits rendered immune as in the blood-serum of other animals, but that in the former they lost their virulence. As we now know that the protective influence of the blood-serum of immune animals consists quite as much in the power to destroy the poisons produced by bacteria as in the power to kill the bacteria directly—already demonstrated examples of this are diphtheria, tetanus, and septicæmia produced by the diplococcus pneumoniae—it is not unreasonable to suppose, in the light of Roger's experiments, that this antidotal capacity of the blood and animal fluids may

be one of the means employed by Nature in disposing of the pyogenic cocci. That these cocci are not directly killed by the extra-vascular blood-serum of rabbits, dogs, swine, and human beings, or if at all in very small number, we know. On the other hand, this serum is an excellent medium for their growth. But if the toxic products of the bacteria are destroyed by the fluids of the body, the bacteria can do no harm, and are at the mercy of the tissues, as has been shown by the recent brilliant researches of G. and F. Klemperer on the diplococcus of pneumonia. When we have a clearer insight into the nature of immunity against the pyogenic bacteria, our understanding of the conditions underlying the infection of wounds will be greatly advanced.

I cannot undertake to discuss all the general conditions of the body, such as diabetes, syphilis, alcoholism, anæmia, obesity, typhoid and other fevers, Bright's disease, etc., which have been regarded as predisposing causes of infection with the pyogenic cocci, some of these diseases upon most conclusive clinical evidence. Gärtner has recently brought forward evidence derived from experiments on animals showing that general anæmia and hydræmia render easier the infection with small quantities of the staphylococcus aureus, and Ribbert has demonstrated that the presence of toxic products of the same microorganism in the circulating blood favors the development of foci of suppuration, a fact which evidently bears upon the pathology of pyæmia and of some cases of furunculosis, as well as upon the importance of evacuating pus. An instance has already been given of the predisposition to infection afforded by intestinal lesions. In dismissing thus hastily the matter of general predisposition to suppuration, it will not be understood that these few words are a measure of the importance of the subject. I believe that the surgeon cannot be too thorough in the examination, before contemplated operations, of all the important organs and functions of the body, and that, wherever possible, he should endeavor to put the patient into the best possible condition of health before undertaking a severe operation.

Of very immediate practical interest to the surgeon is a knowledge of the various conditions in and about a wound which favor the lodgment and development of pyogenic bacteria. In a general way it may be said that anything which interferes with the integrity of the living tissues in a wound is a predisposing cause of suppuration, in case suitable microorganisms gain entrance. Experiments have shown that the necroses produced by chemical irritants, such as carbolic acid and corrosive sublimate, favor the multiplication of the microorganisms of suppuration. Dr. Halsted has shown that the irrigation of fresh wounds by a solution of corrosive sublimate as weak as 1 to 10,000 is followed by a distinct line of superficial necrosis demonstrable under the microscope.

We are not so well informed as to the influence exerted by blood in a

wound. On the one hand, Von Bergmann and most modern surgeons lay the greatest stress upon prompt and careful hæmostasis in surgical operations; on the other hand, Schede has revived and more fully developed an old method of treatment, by which a certain class of wounds are permitted to fill with a blood-clot, and he and other surgeons have obtained rapid and aseptic healing by this method. Is this blood-clot, as such, a source of danger in the same sense as dead tissue is? As has already been mentioned, fresh blood-serum does not possess any such germicidal power over the pyogenic cocci as it does over the typhoid bacillus and many other bacteria. Not being able to find any direct experimental evidence upon the point, I have, with the assistance of Dr. Howard, made a large number of experiments upon dogs. The operations were done with strict antiseptic or aseptic precautions. In most of the experiments a cavity was chiselled out of bone, and this and the rest of the wound were allowed to fill with a coagulum of blood, the conditions pertaining to similar operations in human beings being observed. The blood-clot, after its formation, was inoculated with a culture of the staphylococcus aureus, either by injecting into it a few drops of a fresh bouillon culture or by inserting a platinum loop carrying a bit of the growth on agar. The outcome of the experiments was that the so-called organization of the blood-clot went on as it does in human beings, and the wounds did not suppurate. The staphylococci survived, at least for many days, in the clot, but they did not appear to multiply. This result is in conformity with the experience of Grawitz, who found that the aureus lives for a long time, although it does not multiply, in blood-coagula outside of the body, and that no development of this organism takes place in a solidified mixture of equal parts of nutrient gelatin and blood.

It is not my province to consider the extent of application of the method advocated by Schede to human surgery, nor the advantages of retaining the material employed by Nature in filling up cavities and pockets in fresh wounds as against the insertion of sterilized extraneous material and the obliteration of the dead spaces by deep stitches, which, without great care, are liable to strangulate tissue, produce undue tension, and interfere with the circulation.

Where the healing of the wound by the blood-clot method is not directly purposed, undoubtedly it is important for its aseptic course to check the oozing of blood and to prevent the unintended formation and retention of blood-coagula whose presence is not arranged for by the surgeon in the management of the wound. That loss of blood, as such, predisposes to suppuration has already been mentioned.

In contrast with the negative results of the experiments just mentioned stands a series of positive ones which illustrate the readiness and uniformity with which suppuration of an infected wound ensues which contains masses of tissue strangulated by ligature. These wounds were

inoculated with the same cultures which yielded negative results as regards the infection of the blood-clot.

We have made also a large number of experiments upon dogs by ligating portions of the omentum and then injecting cultures of the staphylococcus aureus, peritoneum. In most of these cases general peritonitis developed, in some localized peritonitis, and in some no peritonitis followed the inoculation.

In order to demonstrate the influence of foreign bodies in favoring suppuration, we inserted into the peritoneal cavity of nine dogs pieces of potato presenting a growth of the staphylococcus aureus, and in every instance general peritonitis developed, although in no case was the insertion of similar pieces of sterilized potato followed by peritonitis; and the injection of 1 c.c. bouillon culture of the staphylococcus aureus into the peritoneal cavity of twenty-three dogs was not followed in a single instance by peritonitis.

There is a gratifying harmony between the views entertained by bacteriologists concerning the power of the living tissues to overcome a certain number of pyogenic bacteria, and the tendency of the modern surgeon to respect these tissues more and more, not to destroy their vital capacities by the unnecessary application of strong chemical disinfectants, not to bruise them, not to make them too tense, not to strangle them, not to suffer the presence in wounds of spaces and foreign bodies, which remove bacteria from the influence of the living tissues and fluids.

From this necessarily hasty and imperfect survey of this division of our subject, it is apparent that, while there is no reason to doubt that the pyogenic cocci are specific agents of infection, the effects which they produce depend upon a variety of conditions, such as the source, the number, and the virulence of the micrococci, the accompanying toxic substances, the part of the body invaded, the readiness of absorption, the presence of foreign bodies and of pathological products, the general state of the patient, and the condition and handling of the wounded tissues.

In giving due weight to each of these factors one should not forget that the infectious material may exist under natural conditions, in a state capable of causing traumatic infections just as directly, just as certainly, just as independently of predisposition, as infection of a susceptible animal takes place with the anthrax bacillus.

As to the various ways by which pathogenic bacteria may gain access to wounds, there is at the present time general agreement of opinion that the greatest danger is from contact with infected hands, instruments, and other objects. The danger of infection by contact is a lesson which has been learned no less by bacteriological workers in the laboratory than by practical surgeons and obstetricians.

The possibility of infection from the air, insignificant as it may be in

comparison with contact infection, cannot be ignored quite as much as some seem inclined to do. The staphylococcus pyogenes aureus has been repeatedly found in the dust floating in the air, particularly of surgical wards where there are suppurating cases. The streptococcus crysipelatus was found by Von Eiselsberg in the air of a ward containing cases of erysipelas and the streptococci found by Prudden in the air of hospital wards were probably identical with this. When we had more confidence than we now have in the power of chemical disinfectants to destroy all bacteria which might accidentally get into a wound during a surgical operation, it seemed proper to disregard the air as a source of infection, and no less a surgeon than von Volkmann could say, "Auch auf einem Abtritte würde ich dreist operiren wenn die Hände rein wären." A privy, by the way, is not the most dangerous place which he could have selected.

Now that our trust in chemical disinfectants for the purpose named is shaken, and that what is called aseptic surgery is the watchword of the day, I believe that a surgeon who aims at the best will try to have the air of his operating-room as free from germs as possible, and will have it so constructed that the floor and walls and all that is in it can be readily cleaned and disinfected. He will regard the influence of currents of air and of commotion in the room in stirring up dust, and will not ignore the value of moisture in laying dust and in keeping it in its place. These suggestions may seem pedantic when the whole tendency of surgery now is to simplify technique and to throw overboard unnecessary ballast, but they appear to me to rest upon bacteriological facts which should not be ignored.

An example has already been given in this paper of auto-infection from the intestinal canal by the bacillus coli communis. The not infrequent invasion of the pyogenic cocci in typhoid fever, diphtheria, scarlet fever, and other diseases with lesions of the alimentary tract, are probably explicable partly by these lesions opening a passage for the bacteria into the circulation, and partly by the predisposition afforded by the presence in the body of toxic substances belonging to the primary disease. It is known that the pyogenic cocci are often present in the alimentary canal. For instance, in a case of perforative peritonitis from typhoid fever, recently examined in my laboratory, there were isolated from the peritoneal exudate, not in single but in many colonies on the roll cultures, the staphylococcus aureus and the streptococcus pyogenes, in addition to the typhoid bacillus, the colon bacillus, and an unidentified bacillus liquefying the gelatin.

Rinne observed in his experiments on dogs that the injection of sterilized putrid fluids together with staphylococci into the peritoneal cavity was followed by suppuration of all open wounds, which otherwise healed kindly, but that subcutaneous wounds were unaffected. The bacteria

found in the suppurating open wounds, however, were not those injected, but were derived from the air. This is unquestionably an interesting and important observation, but he goes too far in supposing that such wounds, as well as other loci minoris resistentiæ, may not become infected from pyogenic cocci in the circulation, as has been demonstrated by the experiments of De Wildt, Waterhouse, and others.

That even under the most unfavorable conditions of general infection a wound may heal by first intention is known to surgeons. In one of our cases, for example, the patient soon after an extensive operation for removal of a cancer of the breast, developed diphtheritic ulcerative dysentery; and at the post-mortem examination were found, in addition to the dysentery, pneumonia, abscess of the lung, and fresh pleurisy, with wide distribution of the staphylococcus aureus; nevertheless, the operation wound had remained perfectly healthy without a trace of suppuration.

Into the burning question of auto-infection from the genital tract in puerperal women I cannot enter, save to say that the pyogenic cocci seem to be present only very exceptionally in the normal tract and do not thrive there if intentionally put in, but that they are found in pathological utero-vaginal secretions, when, of course, they may become a source of puerperal infection. The question is a difficult one and requires further investigation. This passing mention is only intended to indicate that the subject belongs to our theme and may appropriately enter into the discussion.

I must beg permission to defer for a few moments the question of infection from the skin of the operator and of the patient.

That an aseptic wound is not necessarily one free from bacteria has been known since the early days of antiseptic surgery, the subject having been investigated by Ranke, Demarquay, Fischer, Schüller, Watson Cheyne, and others. Kümmell found that pieces of muscle, adipose tissue, or connective tissue taken from fresh wounds immediately after irrigation during the entire operation with corrosive sublimate solution 1 : 10,000, contained bacteria, and the same result was obtained after frequent washing with sublimate solution 1 : 1000.

The most recent investigation of the bacteria in fresh wounds treated antiseptically is by Bossowski, who found, of 50 cases, 10 with negative and 40 with positive result from the bacteriological examination. He found the staphylococcus albus 26 times, the staphylococcus aureus 9 times, the streptococcus pyogenes 2 times, and other organisms, non-pathogenic, 8 times. He several times found a coccus, liquefying gelatin after several days, growing at first white and then slowly turning yellow, and incapable of producing suppuration in rabbits or in wounds. This he proposes to call staphylococcus gilvus. In every case in which the staphylococcus aureus or the streptococcus pyogenes, with or without other organisms,

was present, suppuration occurred. On the other hand the staphylococcus albus produced generally no interference with the healing of the wound, but sometimes it caused a little suppuration of the drain canal or a stitch abscess. In the majority of cases there was absolute *prima intentio*. The small number of the colonies indicated meagre development in the wound.

Drs. Ghriskey and Robb have made under my observation the bacteriological examination of 45 laparotomy wounds treated with strict antiseptic precautions in the gynecological wards of the Johns Hopkins Hospital. The method of treatment and the technique adopted for obtaining the cultures have already been published by Dr. Robb, in the *Bulletin of the Johns Hopkins Hospital*, July, 1891.

Of these 45 cases the result was negative in 14, positive in 31, or nearly 69 per cent. of the cases. The organisms found were the staphylococcus albus 19 times, the staphylococcus aureus 5 times, the bacillus coli communis 6 times, the streptococcus pyogenes 3 times, once alone and twice in combination with the albus. Of the cases with the aureus in only two was there reason to suspect infection from without; in the others this organism was present in the seat of disease for which the operation was performed. In the first case with streptococcus pyogenes the operation was performed for an ovarian abscess which contained streptococci in large numbers; the other two cases probably became infected in some way from the first patient.

In all of the cases presenting the staphylococcus aureus or the streptococcus pyogenes the wound suppurated, and, as a rule, the general condition of the patient was bad.

In many of the cases where the white staphylococcus was found there was no disturbance in the healing of the wound. This was true especially when the organism was found in small number, and when it made its first appearance subsequent to the first dressing, which took place usually twenty-four to forty-eight hours after the operation. In many cases, however, the white coccus was the cause of more or less trouble, although rarely of a serious nature. It was found to travel down to the bottom of the wound along the side of the drainage-tube, and any purulent discharge attributable to its presence was usually confined to the tract occupied by the drainage-tube, so that the drainage-tube distinctly favored the invasion and growth of the coccus. Sometimes fever without suppuration seemed attributable to the presence of this coccus. That this organism is the most frequent cause of the ordinary stitch abscesses has already been mentioned.

Under especially favorable circumstances this white staphylococcus may cause peritonitis, as is shown by a fatal case of hysteromyomectomy where at the autopsy a volvulus of the ileum was found. The stump and the laparotomy wound both looked healthy, but there was a fresh

fibrino-purulent peritonitis clearly starting from that part of the peritoneum agglutinated to the inner edge of the laparotomy wound. This part corresponded to the peritoneum covering the twisted ileum. The twist was not so tight as to have produced gangrene or even a marked hemorrhagic condition; but it had interfered sufficiently with the circulation and the nutrition of the peritoneum to have rendered this a favorable soil for the growth of an otherwise comparatively innocent bacterium, our white staphylococcus having been found in pure culture in the inflamed peritoneum.

The efforts to find out the origin of this very common inhabitant of wounds, treated aseptically or antiseptically, have led us to some interesting and new observations concerning the bacteria of the skin.

The skin may have all sorts of bacteria upon its surface, but, like the mouth and the intestine, in addition to these it has its own distinctive bacterial flora.

If the hands be thoroughly scrubbed with soap and hot water with a sterilized brush, or if this be followed by washing the hands in sublimate solution and the mercury be precipitated by sulphide of ammonium, the cultures obtained from scrapings of the skin so treated will generally be found to contain, as the prevailing organism, the white staphylococcus, and often this will appear in nearly or quite pure culture.

But the most important point is that this coccus is very often present in parts of the epidermis deeper than can be reached by any known means of cutaneous disinfection save the application of heat. We were directed to this conclusion first by experiments on animals. Then the observation of the same white coccus in pure culture time after time in wounds where every possible antiseptic precaution had been taken, pointed to the same deduction. More conclusive evidence was afforded by the examination of skin stitches in cases where at the time of the operation it was proven that the silk used for stitches was sterile and that the surface of the skin after thorough disinfection was sterile. The silk sutures when removed were proven both by microscopical examination and by roll or plate cultures to contain with great regularity the white staphylococcus, often in considerable number, often enclosed within leucocytes, and this not only where a stitch abscess had formed but also where there was not a trace of suppuration or visible reaction around the stitch.

A crucial experiment is the following: The skin is thoroughly disinfected, in the manner to be presently described, so that culture-tubes of nutrient agar or gelatin inoculated by scrapings from its surface remain sterile. A silk thread, sterilized by steam and proven by culture methods to be sterile, is passed one or more times by means of a sterilized instrument through the skin, is withdrawn, and at once a tube of melted nutrient agar is inoculated with the thread and rolled. This amounts to a ready

means of making cultures directly from the deeper layers of the epidermis and the skin, and is a method applicable for many purposes to the bacteriological examination of the skin. By this method the presence of the white staphylococcus, often in pure culture, has been repeatedly demonstrated in parts of the epidermis deeper than were acted upon by any methods of disinfection of the surface of the skin. So far as our observations extend, and already they amount to a large number, this coccus may be regarded as a nearly, if not quite, constant inhabitant of the epidermis. It is now clear why I have proposed to call it the staphylococcus epidermidis albus. It possesses such feeble pyogenic capacity, as is shown by its behavior in wounds as well as by experiments on rabbits, that the designation staphylococcus pyogenes albus does not seem appropriate. Still, I am not inclined to insist too much upon this point, as very probably this coccus, which has hitherto been unquestionably identified by Bossowski and others with the ordinary staphylococcus pyogenes albus of Rosenbach, is an attenuated or modified form of the latter organism, although, as already mentioned, it presents some points of difference from the classical description of the white pyogenic coccus.

We can now understand how, without any flaw in the antiseptic technique of the surgeon, this microörganism may be present in wounds, and we have a satisfactory explanation of the frequent occurrence of stitch abscesses, although, of course, the inference should not be drawn that the white staphylococcus is the only bacterium which may be concerned in the production of these annoying complications.

How much practical importance attaches to the demonstration of this coccus in the deeper layers of the epidermis I am not prepared to say. The surgeon with good technique who does not bother himself about it is not likely to be severely punished by the behavior of his wounds. Those who put drainage-tubes and other extraneous substances into their wounds I think will have to consider it. Dr. Halsted, on the basis of researches on the bacteria of the skin and the difficulties of complete disinfection of the skin of the patient, has abandoned for nearly all wounds the use of skin stitches, the edges of the wound being brought together with admirable coaptation by subcutaneous sutures. The results, both as regards the scar and the aseptic healing of the wound, have been most gratifying. Stitch abscesses are, of course, avoided by this procedure.

Another coccus which we have found, although less frequently than the white coccus, on the surface and in the deeper layers of the epidermis, is one already referred to which corresponds to that called by Bossowski staphylococcus gilvus. This organism seems to bear about the same relation to the pyogenic yellow staphylococcus which our epidermal white coccus does to the typical pyogenic white staphylococcus.

The staphylococcus pyogenes aureus we have found very frequently

IRITIS CATAMENIALIS.

TROUSSEAU (*Archives de Tocologie*, No. 6, 1890) reports the following case: A patient, æt. thirty-five, had menstruated normally until three years before, when she was attacked with iritis in the left eye, which developed two or three days before a monthly period and disappeared with the cessation of the flow. There was no suspicion of syphilis. An oculist diagnosticated irido-choroiditis with hypopyon, and, learning that she previously had rheumatism, prescribed salicylate of sodium. From this time on the patient had a return of the trouble at every period, sometimes a day or two preceding, but usually immediately before the flow—on two occasions *after* it. When examined by the writer the left eye was injected, the iris slightly clouded, and the vitreous turbid, containing small flocculi. The lower fifth of the anterior chamber was filled with pus, which disappeared with slight movements of the head. There was no pain or photophobia. On dilating the pupil with atropine synechiæ were noted. The patient stated that the trouble had been absent during the first eight months of a recent pregnancy, so that she supposed that she was cured, but that it had reappeared during the ninth month at the time when menstruation would have occurred. In five days, under the use of atropine, the hypopyon was absorbed and the eye presented its normal appearance. She had an easy accouchement and menstruated once without a return of the iritis, but before her next period the hypopyon reappeared. On this occasion Trousseau punctured the cornea and withdrew pus, which was subjected to a careful bacteriological examination, that showed it to be laudable as regarded septic qualities. The patient was placed on naphthol and quinine, with vaginal injections of carbolic acid. The following month a transient cloudiness of the iris was noted two days before the period, which quickly disappeared spontaneously, but with the next menstruation the attack was just as severe as before, and was repeated every month thereafter in spite of continued anti rheumatic treatment. The writer, after careful observation, was led to believe that the irido-choroiditis was of infectious origin, the seat of infection being within the uterus, and regretted that he had not made a bacteriological examination of the menstrual discharge, with the view of determining if it contained any septic element which was present only during the period. The fact that the ocular trouble was absent at the first menstruation after delivery would seem to support this hypothesis. Cohu has reported similar cases which occurred during the puerperium.

 PROLAPSE OF THE URETHRAL MUCOUS MEMBRANE IN YOUNG GIRLS.

BENICKE (*Zeitschrift für Geburtshülfe und Gynäkologie*, Band xix. Heft 2) calls attention to this rare affection, of which he has seen three cases. Munzer published a paper on this subject, in which he referred to twenty-one cases, ten of the patients being between six and fifteen years of age. The diagnosis of the condition, as distinguished from a neoplasm, turns upon the cylindrical or funnel-shaped form of the mass which protrudes from the meatus. The symptoms are sometimes so slight that their cause might be easily overlooked. In the writer's three cases his attention was called to it, not by painful or difficult micturition, but by hæmorrhage during the act. The prolapsed mucosa was sensitive in two of the cases.

relation to the sublimate that even after prolonged washing of the skin with alcohol and water they will not grow on culture media until the skin is washed with sulphide of ammonium, may also remain a long time in the epidermis. Hence it may happen that prolonged scrubbing of the hands of such persons simply with soap and warm water may remove so many superficial bacteria that the cultures from the scrapings of the epidermis may show very few, occasionally even no, colonies; whereas, when this is followed by washing in sublimate and then in sulphide of ammonium, a much larger number of colonies appear in the cultures. This apparently paradoxical result, which is obtained only from the hands of those who have previously washed them in sublimate solution, has no reference to the application of the sublimate immediately after the soap and water, but is to be explained by the liberation, by means of sulphide of ammonium, of the bacteria held in check by the mercury used, it may be, several days before the experiment. The same result is, of course, obtained if the sulphide of ammonium be applied immediately after the scrubbing with soap and water. These observations upon the persistence of mercury in the epidermis and its long-continued inhibition of the growth of bacteria, make it necessary in all work upon disinfection of the hands to first precipitate the mercury with sulphide of ammonium whenever the experiments are to be made upon hands which have been washed in sublimate solutions, even if this has occurred a long time previously. Exactly what relation the mercury in the epidermis holds to the bacteria which it does not destroy, but whose growth in our nutrient media it prevents, we cannot say. We may, perhaps, think of these bacteria as enveloped in an albuminous combination of mercury. One thing is certain—that, when the sublimate has been as thoroughly washed off from the skin as possible with water, or has been applied days before, the nutrient gelatin or agar is not rendered unfit for the growth of bacteria by the mere presence of the small quantity of mercury carried into it with scrapings from the epidermis, for the bacteria which have reached the epidermis after the application of the sublimate—and these are often identical with those inhibited by the mercury—develop as usual. It is only those bacteria which were originally brought into contact with the sublimate in some such manner as that suggested which will not grow until after the application of sulphide of ammonium, and it is not—as has been usually supposed in other observations of a similar kind in disinfectant experiments with sublimate—the alteration of the nutrient medium by the presence of a trace of sublimate which inhibits the growth of the colonies.

As to the practical efficiency of disinfection of the skin with solutions of corrosive sublimate, it is to be said that this agent, when properly applied, kills most of the bacteria upon the surface of the skin. The washing of the skin with alcohol immediately before the use of the sub-

on the hands of surgeons and their assistants who have to do with suppurating cases of any kind. It may be present in this situation at least for several days after contact with surgical cases. It was met only exceptionally upon the hands of other persons.

The demonstration of microorganisms in layers of the epidermis deeper than can be disinfected by present methods suggests that more attention than seems now to be customary should be paid to the skin of the patient as a source of traumatic infections. It also admonishes us to receive with caution the statements recently made concerning the elimination in suppurative diseases of staphylococci by the sweat.

A considerable part of our work has been devoted to the subject of surgical antisepsis, and particularly to the disinfection of the skin. Dr. Abbott has conducted in my laboratory careful experiments regarding corrosive sublimate as a disinfectant against the staphylococcus pyogenes aureus, in which many fallacies in previous work on the same subject have been pointed out. In view of the time already consumed, I must ask permission simply to refer to Dr. Abbott's paper on this subject, already published in the *Bulletin of the Johns Hopkins Hospital* for April, 1891.

The conditions for the efficient action of chemical disinfectants have been found to be far more complicated and less easily controlled than was formerly supposed, and the substitution, wherever applicable, of the simple and certain methods of disinfection by heat, such as have been long employed in bacteriological laboratories, is to be commended. Chemical disinfectants still have their place for many purposes in the operating-room, but their place is not in fresh, healthy wounds.

Thorough scrubbing of the skin with soap and warm water by a sterilized brush removes many bacteria, but not all, and it cannot be regarded as a satisfactory means of cutaneous disinfection.

The fallacy in previous work on disinfection of the skin with corrosive sublimate has been that in testing its efficiency the sublimate was not first precipitated by sulphide of ammonium. If this precaution, to which attention was first directed by Geppert, be observed, it will be found that corrosive sublimate accomplishes much less than is generally supposed. Our revision of the work relating to cutaneous disinfection with sublimate has led to some curious and interesting observations, and to results which at first seemed paradoxical.

By examining the hands of surgeons who are in the habit of washing them daily in solutions of corrosive sublimate, it was found that the mercury becomes so intimately incorporated with the epidermis that its presence there can be demonstrated by means of sulphide of ammonium at least six weeks after any contact with mercurial solutions has taken place. Micrococci in the epidermis which have not been killed by washing in sublimate solutions, but which have been brought into such

revealed by the systematic study of traumatic infections is much greater than was formerly supposed. The pyogenic staphylococci and streptococci, however, are by far the most common causes of suppurative affections of wounds.

A coccus, which may appropriately be called the staphylococcus epidermidis albus, is a nearly, if not quite, constant inhabitant of the epidermis, lying both superficially and also deeper than can be reached by present methods of disinfection of the skin. This coccus is found frequently in aseptic wounds. It may be the cause of disturbances, usually of a relatively slight degree, in the healing of the wound, especially when drainage-tubes are inserted. It is the most common cause of stitch abscesses in wounds treated antiseptically or aseptically.

The bacillus coli communis is a frequent invader of various organs of the body in cases with ulcerative or other lesions of the intestinal mucous membrane. In such cases its presence is usually unattended by evidence of pathogenic action, but this bacillus may be associated with inflammatory affections of wounds, with peritonitis, and with abscesses.

There are many reasons for believing that the process of suppuration serves a useful purpose in combating bacteria and preventing their invasion of the circulating fluids and the tissues of the body.

The pyogenic bacteria set up suppuration by means of chemical substances produced by them and entering into their composition. The studies of chemotaxis have shed much light upon the mode of action of these substances.

The effects produced in the animal body by the pyogenic cocci are determined by many factors relating to the infectious agents and to the individual exposed to infection. There are differences in these effects depending upon the species of animal, upon the tissues and part of the body infected, upon the readiness of absorption from the infected part; upon the source, the number, and the virulence of the organisms; upon the nature and amount of the toxic substances accompanying and produced by the bacteria, upon general predisposing conditions of the body, and upon local conditions in a wound such as the presence of foreign bodies, of pathological products, of dead spaces, of bruised, necrotic, and strangulated tissues.

Infectious agents, as they occur under natural conditions, may possess greater virulence than the same bacteria in artificial cultures, and this probably depends upon accompanying toxic substances.

Results of experiments on animals explain clinical experience concerning the aseptic healing of wounds by the so-called organization of a blood-clot.

The tissues of a wound should be handled so as to interfere as little as possible with their vital capacity to overcome bacteria.

Although the greatest danger of infection of a wound from without

limate increases its efficiency to a marked degree. If Fürbringer's method be carried out according to the strict letter of his directions it yields fair results, but it is not certain. If the mercury after employment of this method be precipitated by washing the hands in sulphide of ammonium, it will be found that the results are much less favorable than would appear by cultures made from the skin and under the nails, without the use of ammonium sulphide. It is especially the scrapings under the nails and around the matrix of the nails which yield positive results when ammonium sulphide is used, but often negative ones without this precaution. It need hardly be said that in our experiments all of the well-known, although often neglected, precautions to insure the full strength of the sublimate solutions were observed.

It may be urged that it is not necessary actually to kill the bacteria upon the skin; it is sufficient if they are rendered incapable of growth, and as most of those which are not killed by the sublimate do not grow upon our ordinary nutrient media, it is reasonable to infer that they will not grow in wounds. This line of argument certainly deserves consideration; nevertheless, there is no positive proof that these bacteria will not grow in wounds under some conditions, and surely one will feel safer with a method of disinfection which actually kills the bacteria.

I shall not detain you with the results of our experiments with other disinfectant agents. These will be published in a short time elsewhere. I shall simply state here that we have thus far obtained the best results in disinfection of the skin by the following method:

1. The nails are kept short and clean.
2. The hands are washed thoroughly for several minutes with soap and water, the water being as warm as can be comfortably borne, and being frequently changed. A brush, sterilized by steam, is used. The excess of soap is washed off with water.
3. The hands are immersed for one to two minutes in a warm saturated solution of permanganate of potash and are rubbed over thoroughly with a sterilized swab.
4. They are then placed in a warm saturated solution of oxalic acid, where they remain until complete decolorization of the permanganate occurs.
5. They are then washed off with sterilized salt solution or water.
6. They are immersed for two minutes in sublimate solution, 1 : 500.

The bacteriological examination of skin thus treated yields almost uniformly negative results, the material for the cultures being taken from underneath and around the nails. This is the procedure now employed in the gynecological and surgical wards of the hospital.

The principal conclusions of this paper may be summarized as follows:

The number of different species of bacteria, particularly of bacilli,

found to be less favorable when they are tested after precipitation of the mercury with ammonium sulphide than without this precaution.

The best results in cutaneous disinfection we obtained by a method in which permanganate of potash followed by oxalic acid plays the principal disinfectant rôle.¹

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¹ Cultures were exhibited showing various species of bacteria mentioned in the paper, the white staphylococci and other bacteria isolated from the epidermis, the growths from skin sutures, and illustrating the results of different methods of disinfection of the skin, and the importance of precipitation of the mercury with ammonium sulphide when testing the germicide action of corrosive sublimate on the skin.

is by direct contact, nevertheless the possibility of infection from the air should not be disregarded.

Auto-infection may take place by the entrance into the circulation and tissues of pyogenic bacteria from the alimentary and the genital canals, but there is no evidence that this can occur when these tracts are in a healthy condition. Moreover, with the requisite lesions of these tracts other general and local conditions of the body are important, if not essential, factors in bringing about pyogenic or septic infection.

The presence in the circulating blood and tissues of certain chemical products of pyogenic and of putrefactive bacteria, as well as that of various other injurious substances, favors the growth in wounds of septic and pyogenic bacteria, both of those which may be carried to the part by the circulating fluids and those which may enter from outside of the body.

Whenever we have been able to demonstrate the presence in wounds in human beings of the staphylococcus pyogenes aureus or of the streptococcus pyogenes the wound either was suppurating or subsequently it suppurated.

Only in the minority of cases were the aseptic wounds which we examined free from bacteria. By far the most common organism in these wounds pursuing an aseptic course is the staphylococcus epidermidis albus, which without the presence of a drainage-tube or other foreign body rarely causes suppuration in the wound.

The presence of microorganisms in layers of the epidermis deeper than can be reached by existing methods of cutaneous disinfection points to the skin, especially to that of the patient, as a source of infection to be carefully guarded against.

The substitution so far as possible of subcutaneous for cutaneous sutures lessens the chances of infection from this source, and particularly those of stitch abscesses.

Wherever applicable in surgical antisepsis, disinfection by heat should be preferred to that by chemical agents.

Previous experiments to determine the efficacy of disinfection of the skin with corrosive sublimate are vitiated to a considerable extent by the failure to precipitate the mercury with ammonium sulphide before testing by culture methods its germicidal power on the skin.

The mercury remains for days and weeks intimately incorporated with the epidermis.

Epidermal bacteria not killed by the sublimate may be brought into such relation with it that they will not grow in ordinary culture media until the mercury is precipitated by ammonium sulphide, and such bacteria may remain for days and weeks in the epidermis.

The results of Fürbringer's method of disinfection of the skin are

neutralize another, as it is well known often occurs. Some of these substances are perfectly harmless in their proper places, but deadly in others. The chemical processes going on within our bodies are as complex and as difficult of appreciation as are those mental processes which so bewilder us when sometimes we endeavor to study and read the character of various individuals. Virchow, in his address before the Tenth International Congress, voiced the general sentiment when he said: "The scientific problems of medicine are, for the most part, centred about the determination of the biological peculiarities of animal and vegetable cells." (*Vide* paper by Braatz, *Deutsche med. Wochenschrift*, 1891, No. 22.) "Lépine has lately shown that while the pancreas is pouring into the digestive channel the ferment which will form sugar, it is at the same time emptying into the system another ferment which will destroy it." (Brunton.)

But this is no more than is constantly happening in the alimentary canal, into which the intestinal glands are constantly pouring fluids which shall assist in the digestion of ingesta, while the intestinal absorbents may be taking up poisons produced by their mutual reactions. I esteem the proper realization of this fact as of great importance to the surgeon, as well as a due recognition of the organ through which these various poisonous substances are filtered out before reaching the systemic circulation. The physiologists have shown us that the organ by which this is accomplished is the liver, by virtue of its so-called depurative action. This is but one of its multiple functions. I have upon another occasion endeavored to show that it is by virtue of this hepatic function that many cases of septic intoxication in surgical patients are avoided, and that when this function is interfered with, the most promising surgical case may go wrong or even terminate fatally.¹ I have also there endeavored to show that in the division of the general subject of blood-poisoning a condition which we will call, if you please, intestinal toxæmia, or entero-sepsis, deserves a distinct place; that it occurs not infrequently; that by a continuation of it the condition may be merged into one of sapræmia, septicæmia, or pyæmia, and that when promptly antidoted or checked there is a speedy return to a desirable condition, both of wound and of the patient.

All of which leads to a statement upon which I desire to lay all the stress it may bear, which is to this effect—that when we have apparently commencing sepsis we are altogether too prone to look first to the wound itself for an explanation of its origin. I claim—basing this claim upon observation and laboratory study—that by no means all cases of surgical sepsis have their origin in or about the wound, no matter

¹ "Mütter Lectures on Surgical Pathology." *Annals of Surgery*, vol. xiii., June, 1891, p. 446.

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WOUND INFECTION: THE CAUSES WHICH PREDISPOSE TO ITS PRODUCTION, OR FAVOR IMMUNITY, AND THE ROLE OF ANTISEPTIC AGENTS.¹

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THE study of wound infection is inseparable from that of immunity from the same, and when we have learned that which constitutes or favors immunity, we shall approach nearer that which is now a *terra incognita*. As Brunton has well said, in his recent address before the British Medical Association, "immunity is a complex condition not dependent upon any single factor," and from pathological interest, as well as from clinical importance, our endeavor now must be to analyze the main question, of what constitutes or confers immunity, and try to first recognize and then solve its various subordinate queries.

This statement, too, is inseparable from another, which is to the effect that the surgery of to-day should aim to be *aseptic*, strictly speaking, and not merely *antiseptic*; in other words, we should abolish sepsis, and not merely aim to antidote it or conquer it when present.

The only excuse for surgery which is not strictly aseptic should be met with in cases of injuries where sepsis in some form has already occurred, or those where continuous aseptic precautions are impossible; as, for example, in the mouth, rectum, etc., or in military practice, where the exigencies of the occasion do not permit that which we would ordinarily carry out with precision.

The condition of sepsis itself is a most complicated one, consisting, as far as we now see, of a condition of poisoning by ptomaines, toxines, and albumoses having widely varying strength and properties, some of which are so antagonistic in physiological action to others, that one may

¹ An address delivered before the Second Triennial Congress of American Physicians and Surgeons, at Washington, D. C., September 22, 1891.

since Stahl has shown that the same power is inherent in the plasmodia of myxo-mycetes, as well as in various other unicellular organisms; and what especially concerns us here is the fact that the leucocytes at least, if not various other cells of our own bodies, possess the same property. As yet a general recognition of this fact hardly obtains among the profession, although an elaborate article on the subject has been published recently by Prudden;¹ but it seems to me a matter of common importance to all who study inflammation and its results. Observers in this direction have shown that bacteria, for instance, move toward nutritive material, and this power has been utilized by Ali Cohen to separate motile from immotile bacteria. He filled capillary tubes with positive chemotactic material, like potato-juice, and with this could attract typhoid and cholera bacteria from fæces, and thus make their pure cultivation much easier.

The chemotactic properties of leucocytes remind one very much of the so-called tactile sensibilities which the amœbæ possess, only they enjoy them in perhaps higher degree. Lactic acid; 10 per cent. salt solution, quinine 0.5 per cent., 10 per cent. alcohol, chloroform, glycerin, and bile produce in leucocytes chemotactic activity by which they are repelled. It must be said here that chemotaxis is spoken of as positive or negative, according as there appears to be attraction or repulsion. Among the most actively positive chemotactic substances are cultures of bacteria. These are powerfully attracted by the leucocytes. Hence it appears that bacteria and leucocytes are mutually attractive, and the effect is the same whether the cultures are alive or have been killed by boiling; but it is not the culture medium itself by which this activity is manifested, but by some product of the life and growth of the bacteria.

It has been Buchner's happy lot to widely extend our knowledge of the function and importance of the leucocyte in its chemotactic relations. He has demonstrated that its phagocytic action is but a part of that general power which it possesses of responding to chemotactic attraction and incorporating into itself whatever there is of foreign, dead, or offending material, and then removing it. It matters not that it often perishes in this attempt, that is, it matters not in a logical sense, although a quantity of leucocytes which have thus perished constitute a mass of pus, their dead bodies remaining in this form to show the violence of the conflict, and, as it were, their heroism in the engagement. In other words, it follows from Buchner's researches that the process of resolution is in large measure, or for so much as concerns the solid material resorbed, a matter of chemotactic attraction and its results. Furthermore, that of all substances, that which seems to offer the most attraction for leucocytes is the albuminoid material furnished by bacterial cells

¹ New York Med. Journ., June 6, 1891, p. 637.

how soon the wound may begin to show changes. To this statement I shall recur after a little.

As bearing on what has already been said, however, I wish to appeal to the personal experience of all those who have done general or special surgery. The very facts that careful surgeons prepare their patients for operation and that those who institute the most careful measures in this direction enjoy the greatest success, are, of themselves, proofs of the strength of this position. And the practice which has obtained from time immemorial in such septic conditions as puerperal fever, and many others, of giving a purgative, by which the alimentary canal is freed of toxic materials and the action of the liver stimulated, is additional evidence in the same direction. However others may interpret these conditions, the individuality of a condition of entero-sepsis is for me too apparent to be contested.

We have learned a little, and have yet much to learn, with reference to the antagonisms of different bacteria and the poisons which they produce. If a microbe can enter the system and produce a proteid or albuminoid poisonous to the animal harboring it, it may there thrive and produce such poison, while the injection or the introduction of some other substance may neutralize this poison and save the animal. The principle involved herein is the same whether the antidotal poison be injected as such, or whether a second species be inoculated by which it may be produced. The study of proteid materials is even yet so occult that we know but little about them. Were the truth concerning all the details of our body chemistry known, we should see in every human being a laboratory in which are going on more processes of manufacture and destruction than can be witnessed even in a World's Fair.

Brunton has suggested that blisters do good in this way, not merely by affecting the circulation, but by an endermic administration of proteids derived, of course, from the blood, but so altered in passage from the vessels as to have a different effect, and probably also, as will be seen, by their chemotactic properties. He also suggests that bleeding may be of benefit in a similar way, since experiments have shown that by abstraction of venous blood there is caused absorption of proteid matters from the tissues, and that these proteids may have an action of their own on tissues with which they may come in contact. The indisputable benefits, in many cases, of free purgation probably finds here also its proper explanation.

I have already introduced a term implying a condition but recently recognized, to which it seems necessary to ask your attention for a few moments. It is known under the name, given it by Pfeffer, of *chemotaxis*, and refers to that faculty possessed by all motile bacteria of moving toward or away from certain substances which seem to attract or repel them. This faculty is, however, by no means confined to the bacteria,

The etiology of this affection is somewhat obscure. The patients are usually of delicate constitution, and may or may not have had previous catarrh or irritation of the urethra, perhaps from oxyuria. Masturbation should be taken into account. Persistent cough, as during pertussis, is a possible etiological factor.

In one case, in which the prolapse was less marked, the patient was cured by an application of the cautery. In another an equally favorable result was obtained by replacing the prolapsed mucosa, and narrowing the urethra temporarily with sutures until the redundant tissue was reduced by repeated cauterization. If this does not succeed, the simplest plan is to excise the prolapsed mass and to suture the raw edges with catgut.

THE ELECTRICAL TREATMENT OF CANCER OF THE UTERUS.

WERNITZ (*Berliner klin. Wochenschrift*, September 22, 1890) limits this treatment to cases that are nearly, or quite, inoperable. A large, flat electrode being placed over the abdomen, and a ball electrode applied through a speculum directly to the diseased surface, a current varying from one to two hundred milliamperes is passed for not longer than ten minutes; a *séance* is held daily or every other day. In some cases the growth is punctured with a platinum needle attached to the negative pole. When the positive pole is used a thin grayish slough appears at the point of contact, which separates within twenty-four hours, leaving a clean raw surface, that has less tendency to bleed; with the negative pole there is no visible slough, but a secretion of fluid.

Four cases are reported at length, in which the electrical treatment caused entire cessation of the pain, so that opium could be dispensed with, and marked improvement in the appetite and general condition. Sloughing and foul discharge ceased. The action of the current in these cases is probably two-fold, a local or chemical, whereby healthy granulation and cicatrization are promoted, and an electrolytic, in consequence of which there is a molecular disintegration and absorption of the cancer-cells in the deeper tissues.

PÆDIATRICS.

UNDER THE CHARGE OF
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THE BUCCAL PHENOMENA AND COMPLICATIONS OF MEASLES IN CHILDREN.

CAUVET (*Gaz. Méd. de Paris*, May 31, 1890) claims that during measles there may be two varieties of lesions of the mouth, one being due to the infection of the disease, the other being a superadded complication. The phenomena due to the infection of measles are of two kinds: 1st. Buccal erythema,

It is this that attracts leucocytes, which are brought to the infected area by a magnetism, so to speak, which they cannot resist. This statement is especially true of proteid or albuminoid materials without reference to alkaloids, etc., produced as special products of individual forms. This is the explanation of those cases of that anomalous and clinically unimportant condition known as non-bacterial suppuration, sometimes produced in the laboratory. It is evidenced in such results as those of Wyssokowitsch, who filtered the fluid off from anthrax cultures and found that the filtrate was not pyogenic, while the solid material was.

By ingenious use of Councilman's tubes Buchner proved for the pneumo-bacillus of Friedländer that its free albuminoid material has a marked pyogenic action, and so with numerous others, especially the staphylococci, the bacillus pyocyaneus, and the typhoid bacillus.

It appears thus that the chemotactic activity of bacteria may be exerted by them whether living or dead. In either case they seem to attract toward them leucocytes which then and thus act as scavengers for the surrounding tissues. Buchner has further shown how vegetable caseins and alkali-albumins possess the same chemotactic possibilities.

I would not detain you with a rehearsal of these facts, interesting and important as they are, were it not that they appear to have a most important bearing upon questions which vitally concern the surgeon. First of all, I do not see how in the light of such researches the possibility of phagocytosis can be denied, and the importance of this process looms up in a flood of light when one discusses the phenomena of suppuration, or of other kinds of infection as well as of recovery or immunity therefrom. In suppuration and in absorption, it is proteid material which attracts the leucocytes, the same being furnished either by bacteria or by disintegrating tissue suffering from other infection. Metschnikoff, assuming the truth of his own theory of phagocytosis, invokes that of chemotaxis to explain immunity and freedom after one attack of a contagious disease. He claims that the variety of chemotaxis is variable, and that positive may be converted into negative, or *vice versa*, and that cells may be attracted to substances in mild form, which in strong form they repel, so that by inoculating with attenuated virus chemotaxis at first negative will change slowly to positive, and the phagocyte will at last be induced to attract and attack the invading element of disease. Whatever may be the final outcome of this perhaps fanciful development of his original theory, it is at least the result of laborious research and patient watching.

Those interested in the phagocyte explanation of conferred immunity will find choice reading in the *Transactions* of the recent International Congress of Hygiene and Demography, where, for instance, Roux, Buchner, Kitasato, and Metschnikoff himself, expounded the views which have set students the world over to thinking and to renewed investiga-

tion, and which have made their originators famous. Let it be enough for our present purpose to say that the theory of phagocytosis appears to be more strongly grounded than ever, and that were we deprived of the theory, though acquainted with the facts which corroborate it, we should be at great loss for any rational explanation of the same.

Support of the phagocyte theory has also come from another source, namely, from Hankin's recent work on *Defensive Proteids*. From the spleens and livers of various animals he has isolated the proteid which has the power of killing bacteria, and he has found that this, though absent from normal blood, could be obtained from that of febrile animals. There follow from these facts, if true, various deductions as to the impolitic course of too strenuous efforts to reduce fever in septic cases, upon which, if there were time, one might wish to dwell. This also agrees with Hankin's suggestion that phagocytes not only kill microbes which they have taken in, but can also, by liberating their contents, exert a bactericidal action. It also makes plausible the view that animals that are refractory to particular diseases have the power of producing some particular variety of defensive proteid. There is here opened a most attractive though difficult field for study.

The next important bearing of these views is with reference to the absorption and separation of dead or dying materials, such as large sloughs after extensive burns. These, of course, are loosened by physiological processes in which the formation of proteid material figures largely. By the positive chemotactic properties already alluded to, this attracts leucocytes in large quantities and brings them in numbers where they are needed for tissue repair, and at the same time explains, perhaps, the poisoning with which in these cases we have to deal.

A third not less important bearing is on the use of so-called antiseptic agents. The ideal antiseptic is probably blood serum; its parasiticide properties being, in all probability, connected with the existence in it of a globulin which is only soluble in a weak solution of common salt. This, by the way, may explain the well-known antiseptic action of common salt, and, as Spencer Wells has said, may strengthen the belief that we have in dilute saline solutions a safe and useful fluid for surgical irrigation, preferable to water which has been sterilized simply by boiling, and to various other solutions which may irritate the tissues.

I am not aware that as yet any systematic study of the various antiseptic materials now in general use by surgeons, with reference to their chemotactic activities, has been made. It strikes me, however, that such a study offers the greatest promise of aid in the decision as to what antiseptic to use. But it will be easily seen that once having appreciated this peculiar attraction or repulsion between organized or unorganized materials, we shall have reason to hesitate and reflect before we apply to fresh, raw surfaces, which are supposed to be free from infec-

tion, materials, *i. e.*, antiseptic agents, of a character which may disturb the ordinary physiological course of events by begetting such inordinate excitement, serous outpour, and gathering of the leucocytes, as we have seen may occur.

Although it be here a digression, I cannot avoid for a moment stopping to epitomize some of Hankin's recent work, as well as that of Behring and Kitasato, concerning blood serum and its properties.

The work of Buchner and Nissen showed that the bactericidal action of pure blood serum is an important factor in the conflict between the microbe and the animal organism. This has been further confirmed by Bouchard, who showed that the serum of a rabbit will serve as a culture medium for the bacillus pyocyaneus; but if a rabbit be made immune against the diseases caused by this bacillus, the bacillus can no longer be cultivated on the serum of that particular animal. In other words, by making an animal immune against a disease the bactericidal action of its serum is greatly increased. This is true also in the case of cholera, anthrax, hog-cholera, and other diseases. The investigations of Behring and Kitasato have yielded astonishing results. They found that the serum of a rabbit which had been made immune to diphtheria or to tetanus exerts no bactericidal action on the bacilli of these diseases; but that it does possess the remarkable power of destroying the poisons produced by these microbes. In other words, that such serum has *antitoxic* and *not bactericidal* power, and by taking advantage of such power Behring has cured mice of tetanus in which the disease had so far progressed that two or three limbs were in a condition of spasm. Hankin, in a very recent address (*Lancet*, August 15, 1891, p. 339), in discussing this topic, gives the following definition of immunity in the light of recent study: "Immunity, whether natural or acquired, is due to the presence of substances which are formed by the metabolism of the animal rather than by that of the microbe, and which have the power of destroying either the microbe against which immunity is possible, or the products on which their pathogenetic action depends." In giving this definition he expressly states that it is not comprehensive for all instances, and that in some animals immunity against certain diseases depends wholly or in part upon their causes.

He then goes on to briefly describe how he was able to separate from serum the particular compound which conferred this power. He finally narrowed it down to and isolated a particular ferment-like proteid, known as cell-globulin B. And he further showed how this and other defensive proteids in animals, and we may conclude also in man, can be altered in amount by various conditions of diet, environment, etc.

For these defensive proteids Buchner has suggested the name *alexine*; but Hankin would discriminate between them more carefully, and has divided them into those which occur naturally in normal animals, which

he proposes to call *sozins*, and those occurring in animals that have been artificially made immune—these he would term *phylaxins*. The former he has found in all animals yet examined. He further shows how each of these classes can be subdivided into those that act on bacteria and those that act on the poisons they generate. These sub-classes he would denote by the prefixes *myco-* and *toxo-*; thus *mycosozins* are proteids of the normal animal which have the power of destroying various bacteria, and *toxosozins* are proteids occurring also in the normal animal, which destroy or antagonize the poisons of bacterial origin. Similarly *mycophylaxins* and *toxophylaxins* will denote the classes of the phylaxins.

It has already been stated that by no means all the sources of sepsis concern the wound itself. It is necessary now to classify and briefly allude to the principal reasons why a wound, or a patient who suffers from it, may not be able to resist infection from other sources; or, in other words, to mention the principal other sources of infection possible. These I would classify as follows:

1. Previous long-existent toxæmia (*e. g.*, syphilis, diabetes, acetonæmia, lithæmia, alcoholism, malaria).
2. Previous anatomical changes which reduce vitality (*e. g.*, inherited diatheses, old age, amyloid change, chronic and acute nephritis).
3. Recent or acute toxæmia (uræmia, typhoid, intestinal toxæmia, stercoral toxæmia).
4. Other acute conditions (starvation, scurvy, anæmia).
5. Conditions of environment (bad hygienic surroundings).
6. Effect of anæsthetics.
7. Effect of antiseptics.

1. *Previous long-existent toxæmia.* The disastrous results of operating upon diabetic patients, as well as those presenting active manifestations of syphilis, have long been recognized by surgeons. Nor does one deliberately operate on patients suffering from chronic alcoholism or malaria, if he can avoid it. Other conditions which deserve to be mentioned here as having an occasional yet distinct bearing in this direction are lithæmia, chokæmia, acetonæmia, and the various conditions which are represented by the presence of the oxalates, uric acid, acetone and peptone in the urine.

2. *Previous anatomical changes which lower vitality.* Old age, with its accompanying arterial sclerosis, its cardiac debility, and other well-known tissue alterations, favors sluggishness of wound repair, leads not infrequently to sloughing or to bedsore, and predisposes toward sepsis. Amyloid changes betoken impaired vitality, and chronic or acute nephritis implies that excretion may be interfered with, and some form of toxæmia thereby induced. The inherited diatheses, including tuberculosis and syphilis, may or may not be factors of considerable importance in this respect.

3. *Recent toxæmia.* To illustrate this class of cases a little better, let me mention an illustrative case: A middle-aged woman, of healthy antecedents, recently convalescent from typhoid, which had run an average course, presented a rapidly growing tumor (sarcoma) in one breast. So rapid was its growth that operation could not be delayed. It was made with every aseptic precaution. Nevertheless the skin flaps, which would ordinarily have united without pus, necrosed completely, and left a large surface to heal by granulation.

No one would wittingly operate on a patient suffering from uræmia save in dire emergency. To the condition of entero-sepsis, intestinal toxæmia, or fæcal or stercoral intoxication, I have already alluded. My own studies and experience with this condition have led me to profound conviction, since time and again I have seen commencing septic wound disturbance aborted by the institution of measures calculated to clear out the alimentary canal, this being true of wounds in all parts of the body. The same is true, also, of the toxæmia produced in puerperal, diphtheritic and scarlatinal cases, in which, as is well known, we operate only when compelled to in the interest of life.

One form of entero-sepsis upon which but little has been written, and yet which furnishes a clue to many fatal cases, especially those connected with abdominal surgery, is that produced by the bacillus coli commune. This, as is well known, is a regular inhabitant of the alimentary canal, and its presence there is presumably connected with the chemistry of digestion. Yet, under certain circumstances, it either escapes or is carried beyond its normal limits, and, entering the portal circulation, perhaps the lymphatics also, appears to set up septic disturbances which are typified by the production of septic peritonitis, and possibly other forms of septicæmia in which the peritoneum does not primarily figure. The subject is an inviting one for further research; the condition has hardly yet been dignified by a proper and distinctive name, though Drs. Welch and Councilman, who should be credited with its discovery, term it "colon infection." It is mentioned here only as one variety of entero-sepsis, and as one in which, perhaps, good results are obtained in such cases as those which the gynecologists often meet with, namely, of incipient septic peritonitis, in which the administration of a large dose of magnesium sulphate appears to provoke not merely catharsis, but absorption of septic fluid from within the peritoneal cavity.

4. *Other acute conditions.* As representatives of this group should be mentioned starvation, scurvy, acute anæmia such as follows the post-febrile and post-puerperal state. By all of these conditions vital resistance is so lowered that infection from within or without is greatly favored.¹

¹ Concerning the influence of hunger upon immunity and infection, vide Canalis u. Morpurgo, Fortschritte der Medicin, viii. pp. 693, 729.

5. *Conditions of environment.* Emergency is the only justifiable reason for surgical operation where the hygienic surroundings are bad. Universal experience justifies this statement, but experimental proof of the same is not lacking. The experiments of Trudeau beautifully exemplify this. He inoculated a number of rabbits with tuberculosis, isolated them upon a small island in the Adirondack region, fed them well, gave them every benefit of fresh air and sunlight, and, upon killing them four months later, only one was found to present the slightest evidence of tubercular disease. The same number of rabbits in another group were inoculated in the same way and confined in a dark cellar, amidst damp air with poor ventilation. These became rapidly diseased, and without exception all were notably tubercular. (THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES, vol. xciv., July, 1887, p. 119.)

The popularity of fresh-air missions, the benefit of removal of the poor and ill-fed to good hospitals for operation, and numerous other well-known facts, attest the importance of the matter of environment.

6. *Effect of anesthetics.* There is good reason to think that chloroform and ether administered for some time may produce such changes in the blood and tissues that vital processes of repair, cell resistance, and chemotaxis may be so far interfered with as to facilitate subsequent infection. In making this statement I feel assured of the corroboration of surgeons generally. Yet I know of no particular researches bearing upon it, and would suggest it as offering a fine field for original research.

7. *Effect of antiseptics.* Upon first blush the idea that an antiseptic may favor infection would seem to be essentially opposed to facts. Yet the fact is made clear, both by clinical experience and by experiment. Such an event may happen in more than one way. Mercurial and iodoform poisoning are by no means unknown to the surgeon as arising from the use of these drugs for antiseptic purposes. When this condition is established the case becomes at once one of recent toxæmia, to which I have already alluded. That wounds will fail to unite, and that supuration will occur in these toxæmic conditions, is well known. The individual is so poisoned that his cell-resistance is diminished or destroyed, and in consequence there is little or no opposition to infection.

The other method is by such chemical reaction between vital fluid and antiseptic agent that decomposition of one or both ensues, the antiseptic itself being decomposed, its properties as such lost, while the tissues upon which it acts may have their constitution so changed as to favor rather than resist infection. The best experimental proof of this statement that I know of has been furnished by Abbott (*Johns Hopkins Hospital Bulletin*, April, 1891). Without rehearsing his experiments with mercuric chloride, let me simply remind you of his conclusions:

1. That under the most favorable conditions a given amount of sublimate has the property of rendering inert only a certain number of

individual organisms, since there is a definite chemical reaction between the bacterial protoplasm and the mercuric salt.

2. That the disinfecting activity of sublimate against organisms is profoundly influenced by the proportion of albuminous material contained in the medium in which the bacteria are present.

3. That the relation between staphylococci and sublimate is not a constant one, since organisms from different sources and of different ages behave differently when exposed to the same amount of the salt for the same length of time.

4. That the organisms which survive exposure may experience a temporary attenuation, which, however, may disappear by successive cultivation. (His other conclusions enumerated are irrelevant here.)

From these studies he justifies the statement which has been frequently made, that to the employment of sublimate solutions upon wound surfaces it is plain that there exist at least two serious objections:

First, that the albumin of the tissues and fluids of the body tends to diminish the strength of, or render entirely inert, the solution employed. Since the surgeon possesses no means by which he can determine the amount of such material with which his solutions are to come in contact, he is therefore never in position to say *à priori* that his efforts at disinfection of a wound are or are not successful.

The second objection is that the integrity of tissues is materially disturbed by the application of solutions of this sort.

There is abundance of evidence to lead to the belief that normal tissues and fluids of the body possess the power of rendering inert many kinds of organisms which may have gained access to them. This function must therefore be diminished or destroyed by agents which bring about alterations in the constitution of these tissues. Such changes are known to follow the application of sublimate solutions, which may cause a condition of superficial necrosis, by which the inroads of infectious organisms are not resisted as they would have been had the tissues been left in their natural condition.

From all of which it would appear best to keep not only those, but all other antiseptic agents away, from absolutely clean flesh surfaces. The experiments of Nuttall, Lubarsch, Von Fodor, Bonome, Springfield, and others have shown the value of blood serum as an antiseptic, while the experience of all laboratory workers points in the same direction. Such serum will always be poured out, it is presumable, in quantity sufficient to serve not only as a cohesive but as an antiseptic agent.

Just here in passing the query is provoked, What agent can best be used as an antiseptic? We are learning every day that, providing everything else be clean and fresh, wounds such as made by the surgeon will also be clean, and that the dry method of operating is, per-

haps, the best of all; but inasmuch as the surgeon is often compelled to disinfect an area which has already become infected, he must perforce employ some actively antiseptic agent. It would appear that for most purposes we find the ideal in peroxide of hydrogen, which not merely destroys living organisms, but by oxidation of all undesirable and infected material acts as a scavenger of the tissues, and, in one phrase, when it can be efficiently employed locally, is the conqueror of sepsis.

While such artificial agents as the peroxide must rank as among the highest of their class, it seems to me that we have yet to learn how to utilize to fullest advantage the properties of blood serum. To be sure, this varies among the different animals, and by the limitations of experimental study we are less familiar with such as are possessed by the serum of the human blood than with those enjoyed by that of various animals. For instance, it is well known that a mouse will die of inoculated anthrax, while a rat will not. Also that if the inoculated mouse receive a few drops of rat blood serum it recovers. Practical advantage has been taken of this principle, and it has been proposed, and even carried out, to inject into consumptive patients blood serum of the goat or dog, which are known to be almost immune from tuberculosis. Bonome has found that staphylococci thrown directly into the blood of young animals are there destroyed much more quickly than in that of old animals, namely, in from ten to twenty-five minutes. (This has a bearing on the effect of old age already alluded to.) This bactericidal action of the blood is enhanced if the poisonous extract of empyemic or rather of any old pus be injected into the animal before the experiment, while the extract of recent or acute pus has no such effect. On the other hand the latter, *i. e.*, the extract from acute pus, appears to diminish the chemotactic or phagocytic power of the cell elements. Water also diminishes this bactericidal power of the blood, and an important inference may be drawn from this with reference to the advisability of infusion of saline or other solutions for the relief of acute traumatic anæmia.

Having discussed immunity and conditions which predispose to infection, let us consider how direct infection may be brought about. Infection may be divided into two varieties: Self- or auto-infection and contact infection, including that from the skin and wound, from the air, and from ingesta. And yet, while making these two varieties, namely, infection from without and from within, it must be stated that infection as such is presumably due to the same organisms in either case, and that such varieties are arbitrary and not founded upon essential differences. The causes which lead to auto-infection have been already alluded to, as well as those cases of contact infection which originate from the air and from improper food. To be sure, the experi-

ments of Kocher, and of others, in the direction of feeding animals with putrid or putrifying material, and then insulting the thyroid or bone-marrow, in the endeavor to provoke acute sepsis by infection from the alimentary canal, have not been sufficient to completely satisfy one that by improper food alone sepsis may be caused. But I would make a sharp distinction between such experiments and their results, and the condition of entero-sepsis, which includes only a condition of toxæmia arising from presumably proper food, undergoing perverted chemical changes within the alimentary canal, and there producing poisons as the result of such changes, which, when absorbed, give rise to deleterious effects.

But contact infection, as it usually occurs, arises from the air or from some other unclean foreign substance which comes in contact with exposed raw surfaces. Air contact, is, on first thought, a most fertile source of trouble. Pasteur and Lister first made us fear the air as the most dangerous medium of all, but we have gradually learned that its dangers in any proper operation locality are so small as scarcely to deserve consideration in comparison with the others to be mentioned. Not that germs may not be deposited from the air just as they are in an improperly protected culture-tube, but that nearly all of these are non-pathogenic, and that they, with the pathogenic forms, are nearly always either washed or wiped away, or are destroyed by the blood serum or the phagocytic action of the cells.

The principal sources of contact infection are to be enumerated as follows:

1. Skin and hair.
2. Instruments.
3. Sponges or their substitutes.
4. Suture materials.
5. The hands of the surgeon and his assistants.
6. Drainage materials.
7. Dressing materials.
8. Miscellaneous, *e. g.*, drops of perspiration, an unclean irrigator-nozzle, the nail-brush, the clothing of the operator or the bystanders, etc.

1. *Skin and hair.* The danger here comes not so much from what may be on the surface as from that which may be contained within the hair-follicles and sebaceous and sudoriparous glands. The prevention of infection from this source, therefore, requires more than ordinary shaving of the surface or superficial application of soap and water. Lister claimed for carbolic solutions that they had the power of impregnating greasy material with their antiseptic virtues, though as the latter are very questionable we must doubt the former. But it is vitally necessary that, by whatever means we may, we should make our pre-

cautions reach into these crypts, for the possibility of the hibernation of infectious organisms in the crypts or even the tissues of the skin has been experimentally proven. This is especially true of the streptococci of erysipelas, which have been found latent, but alive, within the skin long after the subsidence of active manifestations of the disease, the skin having become apparently, at least temporarily, tolerant.

What then are the best means of sterilizing the skin? These must depend upon whether time is afforded for careful preparation or not. When we deliberately do a craniotomy or laparotomy we have ample time for such measures, but when an amputation for injury, time and means are both limited.

In the former instance, there should first of all be a careful shaving of the skin, the razor being, as some Frenchman has described it, an admirable dermal curette. I would prefer, then, to use for a day or two some antiseptic ointment, properly prepared (see No. 8), such as one made with resorcin or lysol, and lanolin, by whose use we may hope to bring about absorption into the skin of the antiseptic employed. After one or two days' use of this, the skin should be again thoroughly washed, and for this purpose the best soap is the *sapo viride* of the German Pharmacopœia, with 5 per cent. of lysol or hydro-naphthol. Now for an equal period there should be worn over the part a compress kept moist with some liquid, non-irritating antiseptic. For this purpose creolin or lysol, 5 per cent., or hydro-naphthol in saturated cold aqueous solution, perhaps with a little glycerin added, should be worn until the time of operation. Now everything being ready and the patient being anesthetized, a final scrubbing with hydro-naphthol soap with shaving should be practised, and then the skin washed with equal parts of alcohol and ether or alcohol and turpentine. By this means the operator may feel confident that the surface has been thoroughly disinfected.

In cases of the other class, where time for this programme is not afforded, we must content ourselves with the thorough use of the nail-brush, the razor, and antiseptic soap, with the subsequent use of alcohol and ether upon the skin.

2. *Instruments.* Aside from the information which has long been at hand with regard to the necessity of having clean instruments, I know of nothing so significant as the experience of Thiriard, who had several cases of tetanus following his operations, and whose disastrous experience ceased as soon as he sterilized his instruments by heat. That instruments should be in some way sterilized is now everywhere accepted. The question is now solely with regard to the best method, whether with dry heat, in steam, or by boiling. It appears that the method of dry sterilization injures the instruments, especially those with keen edges, less than any other. For my own part, I prefer a dry sterilizer in which they are subjected for half an hour to a temperature of 140° or 150° C.,

which is usually present at the same time as the nasal catarrh, and consists in a red spottiness, or a simple redness upon the tongue. It may be followed by desquamation of the tongue. 2d. Follicular stomatitis, due to glandular hyper-secretion with obstruction of the excretory canal, and coinciding ordinarily with the miliary eruption of the skin. These phenomena may be due to the poison of the disease, which is eliminated by the glands. The oral complications which are superadded to measles may vary in nature and gravity, and may show the following forms:

1. Muguet, which is the most frequent complication.
2. Aphthæ upon the tongue, the lips, or the internal aspect of the cheek.
3. Ulcerative stomatitis, which may follow rupture of the aphthæ, or may result from infection which has been superadded.
4. Diphtheria, which, as has been shown by Roux and Yersin, may develop whenever there is epithelial desquamation. There is frequently a lingual desquamation following buccal erythema. In other conditions, aside from measles, diphtheria is unlikely first to attack the tongue.
5. Gangrene of the mouth, which is a severe though rare complication.

To avoid these accidents antiseptic washes should be freely used for the buccal cavity. A saturated solution of boric acid will be found very serviceable for this purpose. The washes should be used from the very beginning of the disease, when there may be only a mild degree of erythematous stomatitis. These complications are much more common in hospitals than in private practice, and this is fortunate, for in hospitals they are much more likely to receive the attention that is required.

CROUPOUS PNEUMONIA IN CHILDREN AND ITS TREATMENT.

COPASSO (*Arch. Ital. di Ped.*, 1890) states that between the first week and the sixth year of life children are very susceptible to this disease. Those are especially predisposed to the disease in whom the thorax is undeveloped relatively to other parts of the body. Cutaneous erythema upon the trunk is one of the first symptoms, especially in severe cases, and is probably due to obstruction to the flow of blood toward the thoracic cavity. To the vascular obstruction are also due the albuminuria of the disease, the congestion of the liver, the spleen, and the brain, the softness of the tissues offering no opposition to the dilatation of the capillaries. In cerebral pneumonia the morbid process is usually limited to the left apex, while there is also œdema of the pia mater. The posterior portion of the lung is more decidedly affected than the lateral or inferior portions. Cardiac weakness may follow the disease, and the pulmonary vesicles very slowly resume their original form and volume. Caseation and tuberculization of the exudate in such young patients are rare, and so also are induration, suppuration, and gangrene. It is believed by the author that the theory of the infectious origin of the disease is a correct one. Salicine may not be given with safety at this period of life. Leeches may be used with advantage to the painful portions of the chest. Excitants of the nervous system and the heart, including red wine and quinine, also expectorants, may be prescribed.

to insure the sterilization of catgut. The raw gut, preferably that which has been prepared in the factories for surgeons' use, should have, first of all, its fatty material dissolved out by immersion in benzene or ether. It is then allowed to dry and is soaked for one or two days in a 1 per cent. watery solution of corrosive sublimate, after which it is dried and transferred to oil of juniper berries, and from this to strong alcohol containing one per mille of sublimate. (In this, if desired, it can be boiled.) Catgut thus prepared will, so far as we know, resist every attempt to cultivate bacteria from it. If it be desirable to chromicize it, this may be done before it is placed in juniper oil.

I have, like many others, tried various experiments to accomplish the same results by other means, including moist and dry heat, etc., yet know of nothing which gives such universally satisfactory results as the above.

5. *The hands.* The hands of all those concerned about the field of operation should be carefully disinfected. This includes the surgeon, his assistants, and the nurses or attendants who may handle sponges or dressings. It has not required such laboratory studies as those of Kümmell and others to show that ordinary methods of cleansing the hands do not bring about an aseptic condition. The thousands of times that wound infection has followed contact with the unclean hands of the surgeon or obstetrician bear witness to this fact. It is simply a truism to state that cemeteries have been filled in time past by the septic hands of medical attendants.

How then disinfect them? It would seem almost unnecessary to be obliged to allude here to such measures, yet the use of the penknife and the nail-brush are not always enough. Is it possible for a surgeon to go from the post-mortem room or from a case of erysipelas, or for a surgical teacher to be called from demonstrating on a cadaver to operating in the hospital or in private, without danger of carrying septic material? I think we are now in a position to say Yes, provided he disinfect his own hands and skin, and change his clothing. I know that I have, on numerous occasions, gone directly from a class demonstration on the cadaver to the hospital amphitheatre to operate, and seen patients recover without a sign of sepsis. But how is this possible? Under such circumstances, so far as the hands and forearms are concerned, I would advise to wash them first thoroughly in soap and water, using the nail-brush freely, then to take a tablespoonful or more of flour of mustard and wash the hands thoroughly with this, as if it were a powdered soap. Mustard is certainly an admirable deodorizer, and its essential oil has been shown to be a most valuable antiseptic agent. (This method will serve to disinfect the hands and deodorize them after handling any foul-smelling material or sanious discharge.) Now, before approaching the patient, no matter what may have been done before, aside from the ordi-

although I prefer to content myself with passing a delicate cutting instrument two or three times through the flame. Long immersion in hot water certainly does injure all edged instruments, as does also superheated steam or hot air.

3. *Sponges.* There appears to be nothing to add in this connection to the well-known directions for cleaning and sterilizing sponges. It is important, however, to know whether a sponge which has once been used can be employed again. A careful series of experiments has convinced me, at all events, that sponges which have been used in non-septic cases, and have been carefully cleansed and immersed in antiseptic solutions for a week or more, contain no bacteria that can reveal themselves after approved culture methods.

Nevertheless, in order to be absolutely on the safe side, it would appear better, in many respects, to use some cheap absorbent material as a substitute for sponges, which can be used once and thrown away. There are numerous materials which we can thus employ, proper care being given only to see that they are both absorbent and sterile. A final cooking or baking shortly before use will insure at least this latter point.

4. *Suture materials.* These are mainly animal or metal; silk, catgut, horsehair, and silkworm-gut being the best examples of the former, and iron, copper, silver wire, of the latter. Two essentials are requisite in all material for suture, namely, strength and sterility. Power of resorption is a secondary consideration, although very necessary in certain cases. We may at once dismiss metal sutures from consideration, since it is the simplest possible measure to sterilize them. But the proper sterilization of animal suture or ligature material is a problem on which a great deal of time has been spent. (See the researches of Brunner and of others.)

Silk may be sterilized by boiling, but this weakens it. The best method is to wind it upon glass spools, to drop these into a large test-tube, to plug the tube, and then keep it for an hour in a steam sterilizer, upon two different occasions. Silkworm-gut appears to be much less septic naturally than is catgut, and may be sterilized by immersion in 1 per cent. aqueous sublimate solution for a few hours, and then preservation in alcohol.

But it is with regard to catgut that the greatest study has been excited, and the largest number of preparation methods suggested. It is not necessary here to detain you even with allusion to the work which has been done in this direction, interesting as it may be. Permit me to simply briefly state what I consider the safest and best method by which

¹ Beiträge zur klinischen Chirurgie, vi. 98; Braatz, Ibid., vii. 70; Klemm, Archiv. f. klin. Chir., xli. 4.

Naturally wounds need some protection, and, inasmuch as in certain cases there will be at least a slight discharge of serum or blood, this protection must at the same time be absorbent, and the choice of the absorbent material may well be left to circumstances or to fancy of the surgeon. But the selection of an antiseptic is again a confession of distrust of one's self or of what has been previously done; and while such distrust may be in the interest of the patient, it is not in the direction of scientific advance. Consequently we may say that after the ideal aseptic operation we need only a sterilized and protective dressing—protection from the air without, as well as protection from contact contamination and from the restlessness of the patient. Such ideal dressing may be composed of any sterilized material. The majority of operators, however, desire some additional assurance, or an additional safeguard, which they may, perhaps, secure in the impregnation of the wound-dressing with any one of the more or less reliable antiseptic chemicals. These remarks do not pertain so much to a large group of cases where drainage must be resorted to, and where more or less discharge is necessarily expected. If dressings are to be saturated or much moistened with wound discharges, it is well that they should be charged with some soluble antiseptic. In certain cases the conditions of repair necessitate much purulent or puruloid discharge. It is well that this should be taken up by material which may antagonize its decomposition or putrefaction. Whether this material shall be some soluble salt of mercury or zinc, or something like iodoform, salicylic acid, zinc oxide, etc., is scarcely germane to our present subject; so long as the object aimed at is attained the possibility or probability of wound infection is prevented.

8. *Miscellaneous sources of wound infection.* These are almost too numerous to mention, but illustrative examples of sources of danger may be given as follows:

Drops of perspiration are liable to fall into the wound area from the forehead and face of an excited, fatigued, or hard-worked operator. So also may scales of dandruff from his hair or beard. The former will probably be seen, the latter not. Consequently the ideal operator in this respect is he whose hair is worn short, and whose face is devoid of beard. In almost every clinic are certain irrigator tubes and nozzles intended for daily use. It is quite possible for one of these to be used to day for washing out some old abscess cavity and to be then hung up until to-morrow, when it is used in a case about which pus has neither been present nor is expected to be. Infection may thus be carried from one to the other. It is my custom to disinfect these nozzles with strong solutions of permanganate of potassium, as also the hard-rubber atomizing tubes which I frequently use for spraying out wounds or washing off surfaces.

In many severe cases the surgeon is strongly tempted, sometimes im-

nary scrubbing I would highly recommend the use of the *sapo viride* (G. P.) to which has been added 5 per cent. of lysol, creolin, or hydro-naphthol. Hands and forearms should be thoroughly scrubbed with this, then rinsed and immersed in strongly colored solution of permanganate of potassium. They should then be rinsed again, and now immersed in a solution of oxalic acid, not too strong, and yet sufficiently so to decolorize the skin within two or three minutes. The oxalic solution may be rinsed off, and the hands may now be regarded as thoroughly aseptic. It is expected that occasionally during the course of the operation they will be rinsed in antiseptic solution. This, so far as personal experience goes, is a more reliable method than the use of turpentine or any such material upon the hands.

6. *Drainage materials.* For the most part these comprise horsehair, catgut, soft rubber tubes, hard-rubber tubes, spiral or stiff glass tubes, and gauze strips or wicking. Views and practices concerning drainage have materially changed even since the antiseptic era began. Our predecessors drained to permit escape of pus which they knew would form. Until lately we have drained in order to prevent its formation. We seem now to be on the eve of an era when we need to drain but little or not at all. We resort to drainage now only of necessity, in septic or infected cases. In other cases we drain mainly from habit, or from fear. Indeed, when we start afresh, as it were, without previous infection, the practice of drainage is a confession of fear, or of weakness, both of which are alike unscientific and unfortunate. We have learned that a little blood serum is an advantage rather than a detriment, and we do not need to guard against its presence as we used to. It even seems to me that in many cases, where all other aseptic requirements have been met, we do much more harm than good by the use of drains. Did time permit, it seems to me that it would be justifiable to occupy some moments in a discussion of this single topic. As it is, I will simply justify personal conclusions by mentioning certain classes of operations in which at present I never resort to drainage—never having regretted discontinuing it:

- a. Deliberate operations about the brain and calvarium.
- b. Amputations when in uninfected tissues.
- c. Excisions of joints for conditions other than tubercular.
- d. Herniotomy, both for strangulation and radical cure, when the intestine is still viable and no gangrenous condition is met with.
- e. Osteotomy, tarsectomy, and other operations for relief of deformity.
- f. Most operations for removal of tumors, etc.

This is by no means a complete list, but is simply intended to be suggestive.

7. *Dressing materials.* Two questions come up here: What is the best dressing material? and what antiseptic is most suitable for the case?

ant, because they show that there is not enough diffusion of the antiseptic itself through the ointment mass to exert any such effect as has been generally supposed. Therefore, I assign this fact as illustrating another of the possible sources of wound infection from well-intentioned but misjudged and overestimated protection.

It is well to recall here the investigations of Liebreich, who claims that a coating of lanolin constitutes an almost impassable barrier for bacteria, keeping them in or keeping them out, as the case may be.

And now, without detaining you further, it is necessary that I should bring to a close a paper in which the endeavor has been made to be suggestive rather than complete. The particular features to which I would especially invite attention may be epitomized in the following conclusions:

1. Study of wound infection and of the septic condition thereby produced is inseparable from a study of what constitutes immunity.

2. By a study of immunity is furnished the best clue to a due appreciation of the principles of asepsis.

3. The surgery of the future must aim to be aseptic, for, so far as fresh cases are concerned, we have passed the merely antiseptic era.

4. Asepsis is to be achieved, not alone by attention to the wound and the paraphernalia of operation, but by the closest regard to the condition of the patient's organs and tissues.

5. Sepsis may arise from circumstances and conditions other than those pertaining to the wound itself, although hitherto practitioners have been too prone to scan solely this field when searching for its cause.

6. Sepsis and infection are combated in more than one way by natural agencies and by inherent properties of cells and fluids, totally aside from the measures which the surgeon institutes, and the wisest man is he who studies to take advantage of these vital activities rather than introduce new and conflicting elements from without.

7. A recognition of the power of chemotaxis possessed by organized and unorganized materials, in such varying degree, can be utilized to great advantage so soon as it can be reasonably clearly defined.

8. A study of chemotactic activity appears to impress one with the truth of the phagocyte doctrine, which, if proven, is one having a large bearing upon the principles as well as the practice of the surgery of the future.

9. The proteid material contained within cellular infectious organisms plays such a rôle, both in causing chemotaxis as well as in poisoning the animal infected, that we have reason to eagerly welcome all knowledge concerning it.

10. So fast as such proteid material can be isolated we need, among other things, to study its effects upon the commonly used antiseptic agents.

peratively impelled, to place his hand upon the patient's radial pulse. It has been suggested, and it certainly is good practice, to carefully disinfect the area of the patient's wrist before the operation, so that the operator can, if necessary, feel the pulse without the danger of thereby infecting his hands.

In every well-regulated clinic there are regulations with regard to clothing, and a supply of clean linen is furnished for the operator and his assistants. Some even carry this precaution to the extent of allowing no one in the room who is not thus clad in fresh linen, which will dislodge no dust upon contact. And who shall say that this precaution is not a wise one, even if, perhaps, sometimes superfluous?

Another source of danger, which I have not seen elsewhere alluded to, is one to which of late I have given some personal study. It is customary with many, after the wound is ready for its dressing, to anoint the surrounding skin with some unctuous material, which shall prevent such adhesion of wound-dressing as may make change of the same a source of dread to the patient. In my own clinic this is done almost as a matter of custom. It is quite possible for such ointments to come in contact with the wound; often they are deliberately applied over it. It behooves us, then, to know whether such ointments, which are supposed to be antiseptic, are such in effect. In the surgical clinic of the Buffalo General Hospital ointments containing 5 and 10 per cent. of naphthalin, of resorcin, and of hydro-naphthol are constantly kept on hand. These are made up in part with vaseline, to which lanolin is added. For the purpose of ascertaining in the first place whether the ointment material was or was not sterile, in the second place whether these ointments themselves were reliable, and in the third place whether the method of preparation with or without heat made any difference, a series of experiments has recently been made for me by one of my surgical assistants, Dr. E. J. Meyer, who is also well versed in pharmacy. Briefly, the results of these experiments have been as follows:

1. Vaseline and all other bases commonly supplied for ointments, as they come from the shops, are by no means free from bacterial contamination, the majority of culture experiments made with them being successful.

2. Ointments made with resorcin and naphthalin, even of 10 per cent. strength, prepared without heat, give for the most part growths of various bacteria.

3. Similar ointments made up by the aid of heat, where the temperature of the mass has been raised to the boiling-point of water, seem to be absolutely sterile, and when exposed to the air suffer only from air contamination, so far as found, with non-pathogenic bacteria and the common moulds.

I would regard these experiments as not only suggestive, but import-

uræmic convulsions are a result of imperfect elimination of certain waste products that ought to have been got rid of by the kidneys. Various views have been put forth as to what these products are, where they are retained, what changes they undergo, and in what form they produce the symptoms of uræmia. But there seems to be agreement as to the fact that in health they appear in the urine, for the most part in the shape of urea.

I have not been able to find in any text-book which treats of kidney diseases any proof, or attempt at proof, or reference to proof, that uræmic convulsions are associated with deficiency either of urine or urea. But in conversation with physicians whose line of practice makes them specially familiar with renal disease, I find that the proposition that in uræmia the elimination of urea is diminished is to them a truism so repeatedly verified by experience that no one thinks that the publication of detailed evidence for its demonstration is needful. Doubtless, then, this view is correct. But I have quite failed to get, either from reading or from verbal inquiry, any information as to what *degree* of defect in the elimination of urea is sufficient to produce uræmia, or how long a great diminution must last before convulsions or other uræmic symptoms are produced. One would, of course, not expect that a very rigid limit could be laid down which should hold good for all cases, but surely some law must be capable of definition.

I have published in the *Transactions of the Obstetrical Society of London* (vols. xxix., xxxii., and xxxiii.) a series of twelve cases of puerperal eclampsia in which the urine was measured and the quantity of urea in it estimated. In every case it was found that while the fits were occurring there was diminution in the excretion of urea. These observations harmonize with what would have been expected if puerperal convulsions are uræmic, and the current conception of the pathology of uræmia is correct.

But there are observations which tend to show that the pathology of uræmia is not quite so simple as this. Carter¹ speaks of "the absence of convulsions so often characterizing the uræmia of absolute suppression in persons healthy up to the time of the suppression, of which probably most physicians have seen examples." Sir W. Roberts² says: "Sometimes, however, very great scantiness of urine, or even total suppression (in acute Bright's disease) may exist without evoking any uræmic symptom. In a case of serlatinal dropsy related by Biermer complete suppression of urine continued for five days without uræmia; then followed a further period of four and a half days in which urine was secreted, but only in the scantiest proportions (a few teaspoonfuls a day), and yet no uræmia.

¹ Bradshaw Lecture "On Uræmia," Brit. Med. Journal, 1888, vol. ii. p. 466.

² Urinary and Renal Diseases, 2d edition, p. 421.

11. We need to study much further the anti-toxic and bactericidal properties of human blood serum, and the means by which we can avail ourselves of the same.

12. Some such classification as I have attempted to give of the various causes of lowered resistance to infection, or of the causes of *vulnerability* or susceptibility, will certainly assist in a due appreciation thereof, and will often aid in so fortifying the patient that he may resist infection to which he would otherwise succumb.

13. The condition of entero-sepsis, fecal toxæmia, stercoral intoxication, or whatever it may be called, is certainly one which every practitioner has to fear and against which he should assiduously guard. It is not sufficiently generally recognized and combated.

14. A sub-form of this condition might justly be made and be entitled gastro-sepsis, comprising cases where defective stomach digestion, often from dilatation, brings about a lithæmic or other toxæmic condition which favors infection.

15. Antiseptic agents in the past have worked a revolution in surgical practice and results. We have now reached a time when we know that they all have their disadvantages, and also understand how, if we are strictly aseptic in our work, we can afford to discontinue their application to wound surfaces.

16. But the insurance of the aseptic character of such work necessitates the use of antiseptic agents of some kind upon everything which may directly or indirectly come in contact with these surfaces.

17. When this work is strictly aseptically performed, the use of drains or further employment of antiseptics is either an expression of mental uncertainty or of fear. It may be in the interest of humanity, undoubtedly it often is, but it is not attaining the ideal of scientific work.

TWO CASES OF PREGNANCY WITH BRIGHT'S DISEASE AND ALMOST COMPLETE SUPPRESSION OF URINE.

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AN obstetric physician cannot help being interested in the pathology of puerperal eclampsia. The theory of this disease which has the most reason in its favor is that the convulsions of puerperal eclampsia are caused in the same way as uræmia apart from pregnancy.

But the pathology of ordinary uræmic convulsions appears to me to scarcely yet rest on a firm basis. It seems generally accepted that

restless, could not sleep, and was very thirsty. She passed no urine for fifteen hours after her confinement, when six drachms were drawn off.

Next morning (*October 29th*) she was said to have been feverish, thirsty, and somewhat delirious, and her sight became suddenly indistinct, so that she could only see the outlines of things, but not details. She was brought to the hospital and admitted.

On admission she complained of great pain across the loins and was very thirsty. She was pale and anæmic. Eyelids so œdematous that they could not be separated more than one-quarter of an inch; legs œdematous. Optic discs slightly swollen and outline indistinct, but no retinal hemorrhage in either eye. Sight bad; could count fingers at two feet distance with the right eye; at three feet with the left; could not distinguish faces. Heart's impulse strong and widely diffused. Loud and harsh systolic murmur heard over the whole cardiac area, but especially over the base on the left side. Pulse full, but compressible; 104 per minute. Has not at any time had headache; none now.

30th. At 6 P.M. on the 29th was dry-cupped over loins, and at 7 P.M. had a hot bath, which produced profuse perspiration. At 8 P.M. vomited, and some hemorrhage from the uterus took place. During the night was restless and did not sleep; slight apparent delirium at times.

31st. Patient had a hot-air bath last evening, and sweated freely while in it and for half an hour or more afterward. Loins were again dry-cupped, and this gave great relief, removing a persistent dull pain that had troubled her all day. Eyelids less œdematous than on admission. Is less thirsty. Last night was restless and a little delirious, wanting to get out of bed. No convulsions, nor anything like the premonitory symptoms of one. Is taking milk with lime-water, soda-water, and "Imperial," and tr. ferri perch. $\text{m} \times \text{ter. die.}$ There is occasional vomiting, which does not appear to be provoked by food or medicine. Bowels open five times in last twenty-four hours; motions loose.

November 1. Hot-air bath last night, which produced free perspiration. A retinal hemorrhage discovered this morning. Bowels open once.

2d. Bowels yesterday open thirteen times; motions loose. Troublesome vomiting of green, bilious stuff. Pulse less full. Murmur not so loud. Milk stopped; patient taking brandy and soda and iced water.

3d. Diarrhœa continues. Vomiting less frequent. No pain. Œdema less. Taking now about eighteen ounces of milk in the twenty-four hours with soda-water or lime-water. Ophthalmoseopic examination by Mr. Warren Tay: discs ill-defined, œdematous; numerous small hemorrhages in both eyes.

5th. Vomited yesterday. Pain in umbilical region complained of. Appetite bad. No headache. Restless. Œdema less.

6th. Some diarrhœa. Still very restless. Chloral last night, which gave some three hours' sleep.

7th. Hot-air bath last night; sweated freely. Also dry-cupped.

8th. Hot-air bath and dry-cupping repeated last night.

9th. Signs of neuro-retinitis more marked. Diarrhœa continues. No vomiting. No headache. Sleeps better. Œdema gone.

12th. A few moist râles at lung bases. Has been dry-cupped every other day, and had hot-air bath, in which she sweats freely. Still restless at night.

14th. Appetite improving; patient less anæmic. Still on milk diet.

At the end of this second period the urine began to flow abundantly for a short time, and then again became scanty. Three days later uræmic coma set in, followed by convulsions, which proved fatal."

In the present communication I report a case in which there was almost absolute suppression of urine, lasting a week, and very great diminution in the amount of urine for two weeks; and the excretion of urea was diminished even more than in proportion to the quantity of urine, and yet there were no convulsions.

I report, also, another case in which the diminution in the quantity of urine was not so great as in the first case, and the amount of urea in it was only once estimated; but the flow of urine for more than a fortnight was far below the average of health, and below the quantity passed in some cases of eclampsia.

I refrain from any attempt at generalization, further than to say that Case I. and the case Sir W. Roberts quotes from Biermer seem to me to show that mere diminution of the excretion of urea in the urine cannot be *per se* the cause of uræmic convulsions.

CASE I. First pregnancy: symptoms of renal disease coming on during the last three months; intra-uterine death of fœtus and premature delivery; almost complete suppression of urine for eight days after delivery; great diminution for two weeks; diminution of urinary solids and urea; albuminuria; vomiting; diarrhœa; œdema; delirium; pericarditis in third week after delivery; parotitis in fourth week; retinal hemorrhages; death eleven months afterward. (From notes by Dr. Hugh Smith, resident accoucheur, and Mr. A. H. Smith, clinical clerk.)—M. A. McC., aged twenty-five. Admitted to the London Hospital October 29, 1889, under the care of Dr. Herman. Patient was a domestic servant, and remained in her situation until three months before admission. No previous illness, except smallpox when aged about twenty. First menstruated at fourteen. After the first appearance of the catamenia they ceased for six months, then returned, and from that time till her pregnancy she was regular every month, flow lasting two days, and being scanty and painless. Patient was not married, and the pregnancy was her first.

During the first three or four months of pregnancy patient suffered severely from vomiting every morning. At the beginning of the fourth month of pregnancy her legs began to swell. This swelling was as great in the morning as in the evening. About the sixth month she began to suffer from an enlargement of a vein in the right leg, and for this reason, and not because she felt ill in any other respect, she left off work. During the last three months her face was puffy. Three weeks before admission she noticed that her urine was scanty and dark-colored, and at the same time she had a slight aching pain across the loins. These symptoms lasted about six days. From that time until her confinement she had to get up three or four times in the night to pass water. The water was pale in color and she thought more than the usual quantity.

She was delivered of a stillborn child on October 28th. She thought herself about a fortnight short of full term. The labor was easy, only lasting seven hours. Immediately after delivery patient became very

SYDENHAM'S CHOREA, ITS ETIOLOGY AND CHARACTER.

LEROUX (*Rev. Mens. des Mal. de l'Enf.*, June, 1890) states that the period of development of this disease is from the eighth to the twelfth year, which is also the period of the so-called growing-pains, and frequently of rheumatism. From eleven to twelve—that is, in the pre-menstrual period, girls are more subject to chorea than boys, and it is also the period in which anæmia is very common. In 1888 the author saw 487 cases of anæmia, 395 in girls and 92 in boys. Between the ages of eleven and twelve one sees the largest number of cases of chorea, anæmia, and growing-pains, and in addition many cases of articular rheumatism. The question is raised whether one of these diseases will provoke the other and whether chorea is of a rheumatic nature. A rheumatic chorea has been described, but cases are so numerous in which chorea is evolved independently of rheumatism, that the possibility of a necessary relationship between the two diseases is questionable. Anæmia, infectious diseases, rapid growth, etc., predispose to chorea, but they also predispose to rheumatism. The author agrees with the opinion of Jouffray and Saric, that chorea is a cerebro-spinal neurosis of evolution—a neurosis of growth.

THE OPERATIVE TREATMENT OF CHRONIC HYDROCEPHALUS.

POTT (*Jahrb. f. K.*, xxxi. 1, 2) claims that there are no difficulties which are technically insuperable in operations for chronic hydrocephalus. Not all cases of this condition are suitable for operation, and it is well to consider the probable results in favorable cases, especially in view of the fact that the results heretofore have not been very encouraging. All cases in which the intracranial effusion is extensive must be let alone, also congenital cases in which a rudimentary development of the brain is suspected, such cases being complicated with spina bifida or other serious lesion. In those in which, in spite of the hydrocephalus, the children are psychically and physically well developed, or at least were so before the enlargement of the cranium, an operation may be considered. Such children usually deteriorate slowly but steadily as the result of cerebral irritation or pressure. Any operative procedure in such cases will be the less dreaded when one realizes the gloomy prognosis if relief is not attempted. Such children become imbecile or idiotic; they do not learn to talk, or quickly lose whatever they may have learned. If the pressure continues total blindness will almost certainly result. In an advanced condition of hydrocephalus complicated movements of coördination, including walking, standing, or sitting, may be impossible. If walking is acquired the gait will be wavering and uncertain. Pareses, contractures, partial and general clonic spasms are ordinary occurrences. All these symptoms are more or less conditioned upon the accumulation of the ventricular fluid and the increase of endocranial tension. The circulation in the cranial cavity is weakened and retarded by the pressure and may be stopped. Functional disturbance will follow, and then pathological changes in the brain-substance. If the pressure is removed by arrest of the secretion and ossification of the cranium, restoration to health, to a certain extent, is possible. Most of those who recover suffer with atrophy of the brain and remain idiots for life. In a

15th. Vomited once. Complains of a sensation of something swelling in her head. Slight epistaxis.

16th. About 4.30 A.M. complained of oppression of breathing, which was relieved by sitting up, and a little brandy. At 10.30 A.M. respirations 38 per minute; complained of weight on the chest. Pericardial friction sound heard over a small area to left of sternum. Fine crepitations at lung bases, but no dulness. Patient looks ill; hands and nose cold.

17th. Breathing very distressed. Respirations 40. Pulse 120, small and compressible. Pericardial sound well marked.

20th. Breathing now easy. Pulse 104. Now no abnormal cardiac sounds. Patient seems better in every way.

21st. Left parotid gland swollen and tender; left side of face so swollen that left eye is completely closed. Temperature 100° last night, normal this morning. Pulse 114.

26th. Parotid swelling has disappeared. No pain. Last two days some hemorrhage from rectum, blood being intimately mixed with fecal matter. Pulse 120, very weak. Patient anæmic.

28th. Per rectum, some thickening and great tenderness on each side of uterus.

29th. Some clots passed per rectum. Last two days patient very drowsy. Still vomits once or twice daily. Is much wasted.

December 3. Patient still very drowsy, sleeping the greater part of the day as well as at night. Appetite bad. Frequent vomiting. Tongue red in patches; lips cracked. Since November 28th taking half a pint of beef tea daily, as well as milk diet. Last night vomited a clot of blood. Pulse small and weak.

7th. Vomiting continues. Anæmia marked. The largest of the retinal hemorrhages is nearly absorbed. Outline of discs clearer. Sight better; can read large type.

14th. Patient seems improving. Pulse 90; stronger than before. Tongue clean.

19th. Can read ordinary print easily. No nausea or vomiting for three days. Appetite good. Sleeps well.

27th. Has only vomited twice since last note. Hot-air bath and dry-cupping discontinued. Gets up for an hour every evening. Taking since December 13th ferri-amm. cit. gr. v, t. d. To have now reduced iron gr. iij three times daily.

28th. Breathing hurried and shallow; pulse 120. Loud systolic murmur at heart's apex.

30th. Dulness and râles at extreme base of each lung. Pericardial friction sound. Morning vomiting.

January 1, 1890. Friction sound still heard.

6th. Inflamed swelling over sacrum. Morning vomiting continues.

7th. Patient's weight this morning is eighty-eight pounds. She says that a year ago she weighed one hundred and twenty-nine pounds.

15th. There has been daily vomiting. Appetite not good; nausea after food. Anæmia very marked. Sight better; can read small print for a short time, but sight soon becomes misty. Heart distinctly hypertrophied; no murmur. Arteries tortuous and thickened.

29th. Vomiting rather less since last note. Weight now ninety pounds.

February 3. Swelling of optic discs has increased again, and there are some recent retinal hemorrhages.

10th. Weight now eighty-five and a half pounds. Is sick every morning; appetite bad.

March 5. Retinal changes more marked; fresh hemorrhages; peripheral atrophic patches. Patient cannot sew or read, or distinguish faces clearly at the distance of a few yards. Condition otherwise much the same. During the last week a good deal of sharp and severe headache. Slight puffiness of eyelids. Vomiting on most days. Is less anæmic. Weight eighty-four pounds.

April 8. Weight seventy-eight and a half pounds. Vomiting continues. Very little nourishment taken.

15th. Transferred to the care of Dr. Ralfe. She remained under his care until July 18th, when she was sent to a convalescent home at Brighton. She was again admitted under Dr. Ralfe's care on September 4th. She suffered much from dyspnœa, sleeplessness and vomiting, and died on September 29th.

Autopsy showed effusion into both pleuræ; pericarditis; hypertrophy of left ventricle; fatty heart; kidneys extremely granular, with lines of calcareous deposit in cortex; weight three ounces each. Liver normal.

Urine. Quantity: From the time of the patient's admission until December 23d (*i. e.*, nearly two months) the urine was collected at intervals of two, three, or four hours, but never less than four hours. If the patient did not herself pass water at these intervals, a catheter was passed. Some urine was unavoidably lost with the motions, and, as the patient had a good deal of diarrhœa, these were frequent. In women there is no practicable means of avoiding this source of error. But in the table the number of motions is shown; and it will be seen that the difference in the number of the stools before and after the augmentation of the amount of urine exhibited in the table is not sufficient to account for the difference in the amount of the urine collected. Although the diarrhœa prevents the observations from presenting an entirely accurate account of the renal function, yet it is not enough to explain the difference from the phenomena of health. There is error, but I do not think it material in amount.

During the first week, the amount of urine was so far below the normal standard that the diminution almost amounted to suppression. The average of the first eight days was two and a quarter ounces per diem. During the next five days the quantity increased, the average for these days being eleven and seven-eighths ounces per diem. During the first eight days the average number of motions per diem was seven and a half, and in the succeeding five days seven; so that the difference in the amount lost at stool is no explanation of the deficient quantity of urine at first. By the end of the period just mentioned the urinary secretion may be considered to have been restored to its normal quantity. In the second fortnight the daily average was thirty-six ounces;

third, thirty-one ounces; fourth, forty-seven ounces; fifth, fifty-nine ounces; sixth, fifty-four ounces; seventh, fifty ounces; eighth, thirty-eight ounces; ninth, forty-eight ounces. After this date it was not collected with so much care. The number of motions was not, after the first three weeks, recorded so accurately; but it will have been seen from the notes that the patient frequently suffered from diarrhœa, and yet the average amount of urine collected was rather above than below the average of health.

It may be suggested that the deficient quantity of urine was possibly due to deficiency in the amount of fluid ingested. To anticipate this, I have stated in the table the amount of fluid taken each day. It will be seen that this does not explain the scantiness of the urine.

Specific gravity: During the period in which the urine was so scanty the quantities collected were not large enough to allow the specific gravity to be taken with the ordinary urinometer. A specimen of October 30th, mixed with one of October 31st, gave a specific gravity of 1006. The specimens of November 3d mixed together gave a specific gravity of 1011. From November 8th onward, the specific gravity varied between 1010 and 1014. Therefore not only was the urine deficient in quantity, but the little urine that was passed was deficient in solid contents as compared with that of health.

Albumin: The quantity of albumin was measured by the eye when the urine had been allowed to stand after precipitation of the albumin. Throughout the whole of the patient's stay in the hospital the urine was albuminous. The quantity varied from a mere trace to half the bulk of the urine. Toward the end of the first week (the week of scanty urine) the amount of albumin was rather greater than at the beginning. But taking the average of various specimens, there was no great difference between the quantity of albumin at the time when the amount of urine was greatly deficient, and that when the secretion had been re-established. I am not able to point out any circumstances with which I can connect the minor variations in the quantity of albumin.

The extent to which the albuminous precipitate was composed of *serum-albumin* and of *paraglobulin* respectively, was estimated by separating the paraglobulin with sulphate of magnesia and filtering. There were great variations in the relative amounts in different samples on the same day, from causes which I cannot identify. But comparing broadly the relative quantities during the period of great diminution in the quantity of urine, with those after the reestablishment of the secretion, there is a great difference. During the first week (that of scanty urine) the quantity of paraglobulin was never less than, and usually several times as much as, that of serum-albumin; and on three occasions the albumin was almost all paraglobulin. After the first week the quantities of the two kinds were sometimes equal, sometimes there was more serum-

albumin than paraglobulin, and sometimes there was no paraglobulin. Sometimes the paraglobulin was in excess; but there was never such an excess of paraglobulin as was repeatedly observed in the first week.

Urea: Not only was there, during the period of suppression, the deficiency in the elimination of urea which would have been expected from the scantiness of the urine, but the percentage of urea in the urine was much below the average of health, and below even what would have been expected from the specific gravity of the urine. It was estimated by the hypobromite process.

Day of month.	Day of puerperium.	Urine in ounces.	Urea in grains.	Percentage of urea.	Ounces of fluid taken.	Bowel movements.
Oct. 30	1st	2	5	0.7	110	2
" 31	2d	3	7	0.5	40	5
Nov. 1	3d	2	7	0.6	41	10
" 2	4th	3	8	0.7	36	9
" 3	5th	5½	16	0.7	34	9
" 4	6th	6	18	0.75	25	9
" 5	7th	4	14	0.8	34	5
" 6	8th	2	7	0.85	23	6
" 7	9th	12	50	0.9	35	7
" 8	10th	9	42	1.	37	7
" 9	11th	15	66	1.05	42	6
" 10	12th	14	70	1.05	43	9
" 11	13th	8	36	1.	43	9
" 12	14th	19	90	1.1	42	4
" 13	15th	25	114	1.05	43	6
" 14	16th	29	138	1.05	45	8
" 15	17th	42	212	1.1	58	6
" 16	18th	40	220	1.25	44	3
" 17	19th	39	239	1.4	46	3

On admission the percentage was only 0.7. The next day it fell to 0.5. From this date onward there was a gradual but slow rise till 1 per cent. was reached, on the tenth day. Then the percentage continued from 1 to 1.2 per cent. till the eighteenth day. On the eighteenth and nineteenth days there was a more rapid rise, reaching 1.4 per cent. on the latter day. After this, for the next month it was, on the average, about 1.5. From the combination of a diminished percentage of urea with diminished quantity of urine, the absolute amount of urea eliminated by the kidneys was for a fortnight surprisingly small. For the first ten days it averaged 17.4 grains per diem. The next five days show a slight increase, the average being 53 grains per diem. Then it rapidly rose until an average of 200 to 300 grains per diem was reached. The quantities subsequently were as follows:

Second fortnight, average	.	.	.	231 grains per diem.
Third " "	.	.	.	187 " "
Fourth " "	.	.	.	198 " "
Fifth " "	.	.	.	215 " "
Sixth " "	.	.	.	265 " "
Seventh " "	.	.	.	163 " "
Eighth " "	.	.	.	146 " "
Ninth " "	.	.	.	155 " "

It must be admitted that error from the amount of urine lost at stool, unavoidable in women, makes these figures incorrect in the direction of being too low. In relating the quantity of urine passed I have discussed this source of error, and given the reason for thinking that not much urine escaped collection, and that therefore the figures here given are not *much* below the truth.

Deposit: Owing to the very small quantity of the urine, and to this being used for the estimation of urea, the urine was not often examined microscopically. But on the few occasions on which this was done no casts were found.

Briefly: We have here a case in which for eight days the patient passed only about three ounces of urine, and eliminated about ten grains of urea per diem; and yet there were no convulsions.

CASE II. Eleventh pregnancy: symptoms of renal disease for at least eleven months; edema; cough; vomiting; labor induced at six months of pregnancy; child living; death two weeks after delivery; no autopsy; urine loaded with albumin and containing casts; almost complete suppression of urine for ten days before admission; for a week after admission urine averaging a little more than three ounces per day; gradual but incomplete reëstablishment of the secretion until three weeks after admission, when labor was induced; after delivery rapid increase in quantity of the urine. (From notes by Mr. A. F. Peskett, resident accoucheur, and Mr. Cornish, clinical clerk.)—I. R., aged forty-two. Admitted into the London Hospital May 23, 1885. Patient was a street hawker, and had always lived much out of doors. Had taken stimulants freely, mostly rum or gin. Had occasionally suffered from rheumatic pains, but otherwise had had good health until the present illness began. Was married at sixteen, and had had ten children, the last six and a half years ago.

Two years and a half ago she ceased menstruating for two months, then hemorrhage began and lasted ten weeks. She attended for six weeks as an out-patient at the Metropolitan Free Hospital, and got better. Three months after this she found her legs swelling. She went to St. Bartholomew's Hospital, was treated as an out-patient for five weeks, and got better. From this time she continued well until eleven months ago. Then she noticed that her legs were swelling, that her urine looked bloody, and that she had to pass it oftener than she had been accustomed to. She often had shooting pains in the lower abdomen and back. She menstruated the week before Christmas, and she believed herself to be pregnant. For ten days before admission she had passed hardly any water, not more than a teaspoonful at a time.

State on admission: Patient was fairly nourished, and not anæmic. Complained of epigastric pain and flatulence. No enlargement of liver or spleen. Heart's apex-beat in normal position; area of cardiac dullness not increased. Systolic murmur at apex, conducted toward axilla. Arteries rather hard. Breathing rather hurried and labored; bronchial râles over the chest; cough and expectoration. Ophthalmoscopic examination shows nothing abnormal; no retinal hemorrhages or retinitis. Patient complains of severe frontal headache. Abdominal wall and legs œdematous. Uterus reaching to umbilicus.

The catheter was passed on admission, and the night and morning afterward, but only a few drops of urine were obtained each time. All the urine passed or drawn off was collected and measured.

Pulv. jalapæ co., ʒj, was given on the morning following admission, and acted well. Patient was also given pot. acet. ʒss, liq. amm. acet. ʒj, spt. æth. nit. mxx, three times a day. In the evening of the day after admission she had a vapor bath, and perspired a little after it. Three times during this day the loins were dry-cupped. The next evening (May 25th) the vapor bath was repeated. On May 26th one-twelfth grain of pilocarpine was administered subcutaneously, and the dry-cupping and vapor bath were repeated. A mustard poultice was applied to the loins, and this was repeated on May 27th. On the evening of May 29th patient had a warm bath, and one-twelfth grain of pilocarpine was given subcutaneously, and these measures were repeated every evening until delivery.

Until June 9th the patient's condition appeared to be steadily improving. The cough and shortness of breath were getting better, and the œdema becoming less. There was throughout occasional vomiting. Pulse was throughout about 76 per minute. The temperature never exceeded 99°.

On June 9th and the following days the patient's breath became shorter, her cough and vomiting more troublesome.

Therefore on June 12th it was decided to induce labor. This was done by the introduction of a bougie between the membranes and the uterus. The patient was delivered on June 14th of a six months' fœtus, which lived about two hours.

The patient died on June 29th; no autopsy was allowed.

The urine was tested on May 24th, June 1st, 8th, and 18th. On the three first occasions it was smoky in color, and loaded with albumin. Its specific gravity on June 8th was 1013, on June 18th 1012. On the two first occasions it contained a deposit of epithelial and blood casts; on the two later, phosphatic crystals. There was no sugar. The urea was estimated on June 8th, by the hypobromite process, and was 0.6 per cent. Its reaction was acid or neutral throughout. The quantities collected are shown in the table which follows. Some was unavoidably lost with the motions, therefore the number of motions each day is also given, so that an idea may be formed of the amount lost.

It will be seen that although the very small quantity of urine may be partly accounted for by assuming that some was lost with the motions, yet that there is no such difference between the number of motions per day in the first week and afterward, before delivery and after, as can account for the great difference in the quantity of the urine at these different periods.

May 24	1 ounce.	2 motions.	} 1st week, average per day, 2.9 ounces.
" 25	3 ounces.	3 "	
" 26	1½ "	3 "	
" 27	1½ "	6 "	
" 28	6½ "	7 "	
" 29	3 "	9 "	
" 30	4 "	6 "	} 2d week, average 5.8 ounces per day.
" 31	2 "	5 "	
June 1	4 "	5 "	
" 2	4 "	2 "	
" 3	10 "	4 "	
" 4	6 "	3 "	
" 5	8 "	3 "	} 5 days before labor, average 12 ounces per day.
" 6	6½ "	3 "	
" 7	6 "	3 "	
" 8	10 "	3 "	
" 9	10 "	1 "	
" 10	17 "	6 "	
" 11	18 "	5 "	} Bougie introduced. Collection this and following day im- Delivery. [perfect.
" 12	2½ "	4 "	
" 13	6½ "	3 "	
" 14	28 "	6 "	
" 15	20 "	3 "	
" 16	10 "	3 "	
" 17	33 "	4 "	} Week after delivery, average 25.2 ounces per day.
" 18	30 "	3 "	
" 19	40 "	1 "	
" 20	20 "	5 "	
" 21	28 "	4 "	
" 22	30 "	3 "	
" 23	30 "	2 "	} 2d week, average 29.3 ounces per day.
" 24	24 "	4 "	
" 25	30 "	4 "	
" 26	35 "	3 "	
" 27	32 "	2 "	
" 28	24 "	2 "	

Both in this and in the former case, the diminution in the quantity of urine was far below what has been observed in some cases of eclampsia.

In this case, on the unfortunately few occasions on which the urine was examined, the specific gravity was found (as in Case I.) less than normal, and the percentage of urea even less than would have been expected from the specific gravity of the urine.

Seeing how powerful a diuretic urea is, may not the explanation of the suppression of urine in these and similar cases possibly be a deficient formation of urea? This would account for the small quantity of urine, the deficiency of urea in it, and the absence of so-called uræmic symptoms.

ASEPTIC AND ANTISEPTIC DETAILS IN OPERATIVE SURGERY.

BY ARPAD G. GERSTER, M.D.,
OF NEW YORK.

THOUGH it must be conceded that the process of evolution of the principle which underlies safe operating is a closed chapter in surgery, yet it cannot be denied that means have lately undergone change, and

are still undergoing improvement. The main feature of this improvement is the simplification of our procedures. And simplification means an easier comprehension, a more ready acceptance by the general practitioner, and a beneficial spread of the practice of aseptic and antiseptic measures.

One of the most interesting features of the birth and infancy of the Listerian idea was the circumstance that this vast practical revolution in surgical management was based on purely scientific facts, seemingly of mere theoretical interest. I refer to the use made by Lister of Pasteur's researches. To one familiar with the character of these researches, it will be very natural that Lister's first steps in practically establishing the value of Pasteur's results were dominated by the idea of the necessity of chemical sterilization, or, as it was then called, disinfection. How strong and persistent the hold of this thought was upon the minds of men is best illustrated in the remarks made by Lister himself in a lecture or paper delivered not very many years ago. In those days Volkmann taught that in preparing the field for an operation, shaving and scrubbing of the skin ought to precede the application of the carbolic solution. Lister deprecated these measures as over-zealous and unnecessary, and if the printed report can be trusted, the tinge of a sneer was not mistakable in his critical observations. He contended that the great efficiency of carbolic lotion and spray made these plainer methods of disinfection superfluous. Of course, I must add that since then Lister has changed his position.

As a matter of fact there is no doubt now that the powerful action of the razor, of soap, and a stiff brush, goes far beyond anything that can be accomplished in the way of disinfection, even by the strongest permissible antiseptic. We know that, beside the filth adhering to them, epidermis and hair contain not only hosts of harmless and noxious germs, but that epidermis, hair, and clinging filth are all by necessity or accident more or less coated and permeated by various oleaginous substances which form an effective barrier to the penetration of all watery solutions. Hence, to insure the penetration and imbibition of a chemical sterilizer contained in a watery solution it is first necessary to remove this coating of grease. And what agent is better capable of doing this effectually than emollient potash soap, applied with plenty of hot water and the thorough action of a stiff brush made of the bristles of the hog? Grease, filth, and effete epidermis, harmless and pathological germs, are swept away all alike, rapidly and thoroughly, and with admirable impartiality. When the germicidal lotion is finally applied to the cleansed skin, there is very little to kill in the shape of noxious organisms. Lack of time forbids my entering into the scientific demonstration of the facts just related, but I refer those interested in the proofs of the inhibiting effect of oleaginous substances upon the action

of aqueous disinfectants to the conclusive article of Schimmelbusch.¹ Far be it from me to depreciate the value of the experiment which demonstrated that a noxious germ finely distributed in a generous quantity of water, to which was added a powerful germicide in a certain minute proportion, would promptly succumb to the deadly influence of this chemical. I only desire to point out the fact that these noxious organisms are not met with in the shape of thin, watery emulsions by the surgeon, but are found imbedded in dense masses of what Lister appropriately called "lumps of dirt," in conglomerations of grease and epidermis, in powerful plugs of sticky slime, pus, and blood clot. Therefore let us *first* emphasize the paramount antiseptic value of the homely methods employed for cleansing dirty surfaces comprised in the term of *mechanical purification*; and *secondly* point out how infinitely more they accomplish than any form of chemical disinfection by watery germicidal solutions alone. Both should be combined.

Next in importance to the cleansing of the field of operation stands the question of the sterilization of the hands employed at an operation. Both Kuemmel² and Fürbringer³ have brought abundant experimental proof of what enormous quantities of truly pathogenic germs are habitually lodged under the finger-nails of even the most cleanly persons, and especially of physicians. It matters not how often their hands were washed with soap and brush, the scrapings of the finger-nails always contained an abundance of noxious germs. We know that to facilitate digital examination, the surgeon's finger is lubricated with oil or vaseline. Not inconsiderable quantities of oleaginous matter intermixed with pathogenic bacteria persistently cling to the deepest recesses of the subungual space, and this fatty deposit prevents the effective penetration of germicidal lotions. Fürbringer's investigations have shown that the following process will invariably render the surgeon's hands germ-free: The nails should be kept trimmed short; the hands are to be scrubbed with brush and soap in hot water for one minute, especial attention being paid to the subungual spaces, which then are to be scraped carefully with a nail-cleaner, the hands to be immersed for another minute, first in strong alcohol, then in a 1 : 1000 solution of corrosive sublimate. Even hands that were in prolonged contact with intensely septic matter can be instantly rendered reliably aseptic by this process. This is comforting for the surgeon to know, who during the progress of an operation may be compelled to insert his finger into the rectum or oral cavity for the sake of necessary verification.

When my thoughts revert to the old days of spray and unlimited

¹ Archiv für klinische Chirurgie, 1891, p. 129.

² Centralblatt für Chirurgie, 1885, Beilage zu No. 24, p. 26.

³ Idem, 1888, p. 83.

carbolic acid, the first thing remembered is the habitually shocking condition of our hands. Martyrdom means testimony, and the martyred state of our hands bore shining testimony of the earnestness of our faith. We all believed in the necessity of unlimited chemical sterilization, especially as to our instruments. Fortunately, all this has been changed for something better, and this we owe to Davidsohn,¹ who taught us to sterilize instruments by boiling.

But let us first examine whether the usual steps of the mechanical cleansing to which surgical instruments are subjected are adequate or not. That they are very important is very evident, inasmuch as by them is removed the bulk of blood, pus, shreds of animal tissue, and ointments clinging to their interstices and rough surfaces after an operation. Yet even the most thoroughgoing scrubbing in hot water with soap and a stiff brush will not render instruments aseptic. Schimmelbusch² has subjected instruments thus cleansed to bacteriological examination. He found that especially to artery forceps a considerable quantity of noxious germs were constantly adherent, and that only the simplest instruments were irreproachable.

Another factor has to be considered. In the large practice of our hospitals, where from three to five operations are performed at one session, the minute cleansing of a large instrumentarium after each operation is tedious, involving considerable time. We either had to submit to this, or had to provide a disproportionately large and costly set of duplicates and triplicates. As a matter of fact, the latter thing was rarely resorted to, and the cleansing of the bloody instruments being hurriedly and often inadequately done, main reliance was placed upon the disinfecting power of our carbolic acid bath. And as consideration for the assistants' hands had gradually caused the abandonment of the stronger for weaker solutions, frequent failures in securing primary union were the result of these evasive attempts.

As mentioned, Davidsohn demonstrated that boiling for five minutes in a covered vessel charged with water was invariably followed by a faultless sterilization of instruments thus treated. But the great drawback of this plan was that all steel objects thus treated, unless they were perfectly protected by nickel-plating, became rusty and were sooner or later ruined. This objection does not apply to its full extent to sterilization by superheated air; but the necessity for costly apparatus and the tardiness of the process³ make this plan evidently impracticable. Sterilization by steam presents the drawback of rusting in a still greater degree.

¹ Berliner klinische Wochenschrift, 1888, No. 35.

² Loc. cit., p. 147.

³ Poupinel: "La sterilisation par la chaleur," Revue de chirurgie, 1888, p. 669.

case which was operated upon by the author great improvement followed each withdrawal of the fluid. The comatose condition passed away, the pupils reacted to light, the pulse became fuller and stronger, the breathing regular, and the desire for food returned. The entire condition of the patient was satisfactory until the appearance of pus in the cerebro-spinal fluid removed the hopes of success which had been experienced. If in any given case suppuration could be avoided, incision and drainage would furnish better prospects of success than any other plan of treatment which has been suggested.

PUBLIC HEALTH.

UNDER THE CHARGE OF

EDWARD F. WILLOUGHBY, M.D.,
OF LONDON.

THE MICROBE OF MALARIA.

DR. F. PLEHN, in the *Zeitschrift für Hygiene*, Bd. viii., H. 1, 1890, gives an account of some researches of his in this subject, and a history of the opinions entertained by others during the last twelve years.

In 1879 Klebs and Tommasi-Crudeli described a bacillus found by them in the water and soil of the Roman Campagna, which they were led by certain experiments to look on as the microbe concerned in the causation of malarial fevers.

In 1880 Laveran found in the blood of a subject of malaria in Algiers an organism, not present in that of healthy persons, which he called *Plasmodium*, and maintained to be the essential agent of the disease, in opposition to Klebs and Tommasi-Crudeli.

Ziehls in 1882, and von Sehlens in 1884, discovered bacilli and cocci in the blood of malarial persons in Italy, but made no experiments. Previously to 1880 Koch's method of pure culture was unknown, and though Klebs and Tommasi-Crudeli had never found the bacilli in the blood of patients, the transfusions of Doehmann, Gerhardt, Cuboni, Golgi, and Marchiafava were considered to be conclusive. But the Nestor of bacteriologists, Fred. Cohn, has since deprived the bacillus of all claims to a pathogenic character, Klebs himself has at last disowned his fondling, and Marchiafava and others have gone over to the other side.

Laveran's conclusions have been supported and vindicated by the observations and experiments of Marchiafava, Celli, and Colgi in Italy, Metschnikof, Czenzinski, and Sacharof in Russia, Sternberg, Councilman, and Osler in America, and of Laveran himself in Corsica, Tonkin, Madagascar, and Senegal, whose combined experience has established its claims almost beyond question, though Dujardin, Pfeiffer, Rosenstein, and Hoffmann have alleged that the *plasmodium* is present in the blood in other febrile conditions, as

the patient, in close contact with vaseline, feces, urine, sputa, blood, pus, ichor, and what not. After use it is deposited on the washstand without any special care as to the removal of filth clinging to thousands of bristles and their interstices. It is no wonder that brushes thus treated become very hotbeds of infection.

Various expedients were employed to overcome this obvious evil, among which shall be mentioned first the exclusive use of new brushes in the preparation for each major operation, especially laparotomies; then the disinfection of brushes by continuous immersion in strong sublimate of mercury solution, and finally, the rejection of all brushes and employment of bundles of excelsior instead, which are thrown away after each single use (Neuber).

On account of its great effectiveness the banishment of the brush could be viewed by the surgeon only with regret. Hence let us examine whether a simple and practical way has not been devised to keep this implement clean.

I have again to refer to Schimmelbusch,¹ who has shown beyond any reasonable doubt, that a single and brief immersion in a strong germicidal solution is inadequate to destroy the noxious forms of bacteria contained in surgical nail-brushes. He found that brushes used in the wards and private rooms of the Berlin clinic, which were simply kept in the stereotyped dish alongside of the wash-basin, literally swarmed with pyogenic organisms. Further, he established that to satisfactorily disinfect a brush containing pathogenic germs, an immersion in strong mercuric solution of at least ten minutes was indispensable. If we consider how often brushes fresh from use on infectious cases and still filled with soapsuds are thrown back into the vessel set aside for their immersion, there to give up their contents of soap, which render the sublimate solution inert, we must conclude that under such circumstances even fifteen or twenty minutes will not accomplish a perfect sterilization. Hence we see with pleasure the demonstration of the fact by Schimmelbusch, that boiling of the most unclean brush for five minutes in a 1 : 100 soda solution will always render it absolutely aseptic. Ordinarily, then, surgical brushes should be always kept immersed in a 1 : 1000 sublimate solution, and should be always boiled before laparotomies, or whenever intensive infection has occurred. Finally, brushes carried about in the open satchel of the surgeon, or those found on the washstands of patients, should also be boiled before use.

Whenever I have watched the process of impregnation of our absorbent dressings, as it is carried on at our large hospitals, I could not avoid the feeling of uncertainty regarding the desired result. The repeated

¹ Loc. cit., page 161.

If we then had some reliable means of safely preventing the inroads of rust upon our instruments during sterilization by boiling, we would possess a rapid, simple, and thoroughly practical way of accomplishing our purpose. Common washing-soda, as found in every household, if added in the proportion of one per cent. to water, is endowed with the valuable property of preventing the formation of rust on steel during boiling. And we owe this expedient to the ingenuity of Schimmelbusch.

Let me now practically illustrate in another direction the vast importance of this simple, rapid, and reliable manner of cleansing instruments. It must appeal with peculiar strength to the sensibilities of the general practitioner and country surgeon. Look at the ordinary surgical pocket-case, containing the chief and often only available instrumentarium in a grave case of emergency. Its leather and lining are well worn and more or less soiled, both from long use and the necessity of carrying it about with us in hot and cold weather, rain and shine. Bathed in the vapors of perspiration, freely accessible to dust and dirt, it soon becomes the very negation of what is tidy. Imagine that a fresh case of compound injury to bone or joint, vessel or tendon, has to be dealt with, and that at once. Under these circumstances the instruments drawn from the pocket-case were always employed by me with much reluctance and no little trepidation. Only when the case brooked absolutely no delay and could not be tided over by temporary expedients permitting postponement of the operation to a safer occasion, did I operate. The cleansing that could be bestowed on such instruments on such occasions must needs be inadequate, and one had no choice but to trust to luck.

How different matters are, when we know that to put our instruments in a perfectly aseptic condition we need only a covered pot of boiling water charged with washing-soda, one tablespoonful to the quart. After five minutes of ebullition the contents of the pot, instruments, water and all, are emptied into a clean pan, and the operation may proceed.

In hospitals a sufficient supply of cold sterilized soda solution can be kept on hand, to be poured over the hot instruments as soon as they are placed in the instrument tray. Lately we have used at Mount Sinai Hospital simple boiled water for this purpose, with perfect satisfaction.

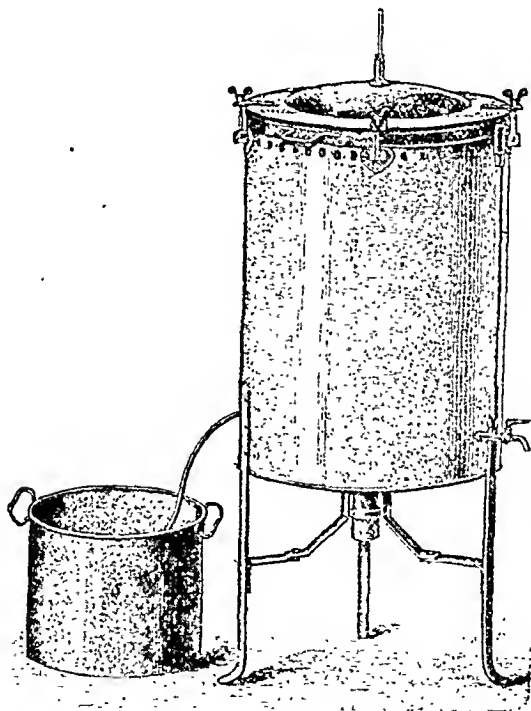
In recapitulation, we will say that instruments should be first cleansed with soap, water, and brush, then boiled for five minutes in a covered vessel containing a watery solution of washing-soda 1 : 100 (one heaped tablespoonful to the quart).

We have seen, from the preceding remarks, how important a rôle is played in modern surgery by the humble scrubbing-brush. And yet there is no other implement so generally neglected as this, and none that receives less care in practice. In hospital and the private office we see the brush used indiscriminately on the hands of the surgeon, the skin of

able dressing has to be procured, *extempore* boiling in a soda or potash solution of about $1\frac{1}{2}$ per cent. for ten minutes is incomparably the simplest and most practical manner of getting an absorbent and aseptic material. In this procedure we recognize at once the familiar ways of the laundry, the eminently aseptic results of which have been demonstrated beyond any reasonable doubt by Behring¹ in the Berlin Hygienic Institute. Thus cotton or linen stuff, to be found in every household, can be rapidly rendered serviceable for surgical purposes by a short boiling in soda or potash lye. Well rung out, it can be immediately used, and will dry rapidly *in situ* under the influence of the body-heat and exposure to the air.

Sterilization by hot air has also been shown to be sufficient, and would deserve serious attention but for the necessity of employing costly and complicated apparatus.

FIG. 1.



Lautenschläger's apparatus for the sterilization of dressings by steam.

But these objections do not prevail as to a steady current of slightly superheated steam. The apparatus needed for this purpose is simple, cheap, and durable, and as I have ascertained during an extensive tour of investigation, embracing a considerable number of Continental clinics,

¹ Zeitschrift für Hygiene, 1890.

handling of large quantities of material by a certain number of persons required in folding, immersing, wringing, unfolding, drying, refolding, cutting, and final storing, cannot but impress the observer with the suspicion of contamination. Add to this the mistakes made in mixing the solutions used for impregnation, and the resulting over- or under-charging of the dressings with chemicals prone to evaporation or chemical change, and it will be seen that impregnation itself is apt to be very uncertain as to its absolute value. As to the merits of the processes employed by various manufacturers in preparing disinfected dressings, I will only remark, that as their gauge of success is a purely commercial one directed solely to profit, the work being done by persons to whom the essence of a surgically clean procedure is a matter of utter indifference, their trustworthiness must be a factor not amenable to direct proof and demonstration.

But let us see wherein dwells the antiseptic property of our surgical dressings. Can it be the inconstantly represented chemical agent, which even if present in the prescribed quantity, is nearly inert, or is it some other factor? The answer is that we know that the high antiseptic value of our intensely absorbent dressings depends on their quality of favoring rapid evaporation, rather than on any chemical properties they may possess. The curing of meat and fish by exposure to the sun is one of the most ancient preservative processes, and well known to be highly effective. As to the effect of evaporation upon pathogenic microbes, Schlangé¹ has shown that the bacillus of green pus, for instance, inoculated upon moist pads of cotton—was aggressively prolific if kept under a glass cover which prevented evaporation. On the other hand, its proliferation was immediately checked if the pads were freely exposed to air and became dry by the loss of moisture. I cannot but fully indorse the statement made by Schimmelbusch, that the effectiveness of highly absorbent and rapidly drying dressings, even if they contained a moderate amount of schizomycetes, is much greater than that of materials which, however faultlessly impregnated, are lacking the properties just mentioned, as, for instance, Lister's resinous gauze.

Looking aside from the objectionable and unreliable features of impregnation itself, let us not forget the disagreeable influence of the chemicals used in this process upon the skin of surgeon and patients. The intensive eczema so frequently produced underneath our sublimate and carbolic dressings is a serious drawback of not small moment.

All these objections vanish if preference is given to one or another mode of sterilization by dry or moist heat. Of these modes only three need to be considered.

First comes the simple process of boiling. For purposes where a reli-

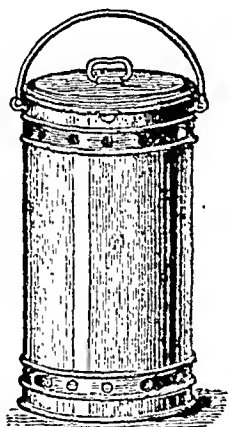
¹ Archiv für klinische Chirurgie, 1887.

five minutes. After this the boxes are taken out, their air-holes are closed, and the dressings in them remain clean and undefiled by any contact until the moment when they are taken out and applied to the wound.

Protected from all undesirable contact by the tin case, aseptic dressings can be thus transported anywhere, to be used wherever occasion requires. I need not add that gauze or cotton is not rendered absorbent by steaming alone, and must possess this property before sterilization. This apparatus was recently acquired for Mount Sinai Hospital, New York, where it can be inspected.

Dressings thus prepared possess all the requisites demanded by modern surgery. They are cheap, aseptic, can be kept so indefinitely, and do not irritate the skin.

FIG. 3.



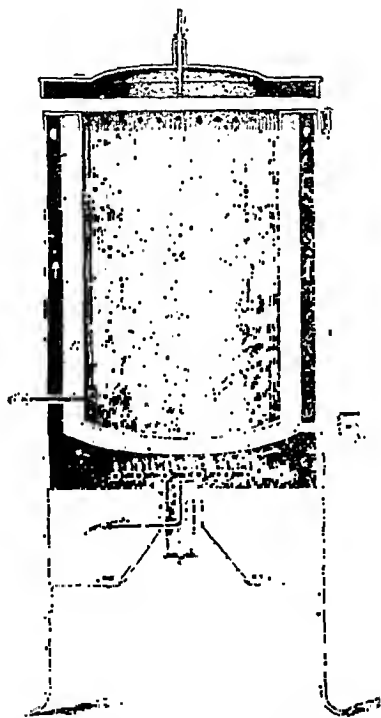
Schimmelbusch's box within which dressings are placed in steam chest of sterilizer. *a* and *b*, air-holes.

The sponge is a surgical requisite so full of excellent qualities that no substitute has as yet succeeded in displacing it. A very good article, known as the Florida sponge, can be bought here for such a trifling sum that we can easily afford to use a sponge but once. Among the many processes recommended for its disinfection, that by boiling is to be absolutely condemned, as it robs the sponge of its most valuable properties—its softness, elasticity, and power to absorb. One of the most effective processes has been abundantly tested by myself in hospital and private practice for seven years, and these are its simple details: The sponge is to be freed of its calcareous impurities by dry beating and a short immersion in standard dilute muriatic acid. Traces of the acid having been washed away, the sponges are left for two days in water to give the spores contained in them a chance to germinate. The reason for this is the fact that proliferating microbes succumb much more

has been and is there universally employed with unvarying satisfaction. The apparatus I refer to is made by Lautenschläger, in Berlin, from plans by Schimmelbusch, and has several features to commend it. First, its moderate cost, easily afforded by every hospital, and even a busy surgeon. Secondly, the absence of the danger of explosion, the rapidity with which it is set in motion, and the thoroughness with which every fibre of the articles placed within it is permeated by steam, which enters the receptacle containing the dressings from above, displacing all atmospheric air, finally escaping through a tube at the bottom of the apparatus, whence it is conducted into a pail of cold water to effect its precipitation.

Another ingenious feature of this apparatus consists in the employment of a number of perforated tin boxes, which can be closed at will, each of

FIG. 2.



Sectional view of Lautenschläger's steam sterilizer.

these containing everything that is to be used at a given operation. Supposing that three operations are to be done, one after another, three of these boxes are charged each with all the dressings, towels, and surgeons' gowns to be used on that occasion, and are placed within the steam-chamber of the apparatus. The flames are lighted, and counting from the time that the thermometer connected with the apparatus indicates 100° C. the contents are exposed to the action of steam for forty-

often made necessary in former days by the absence of anæsthesia, have almost all been eliminated from surgery. Dissection is made safe by adequate incisions and by the control of hemorrhage, which keeps the field of operation comparatively dry. By the skilful use of retractors the track of the knife is laid bare to the scrutiny of the eye; and blunt methods of severing tissues being avoided wherever possible, clean-cut surfaces are left behind, more prone to heal than bruised and torn ones.

The immediate effect of anti-parasitic principles upon the improvement of operative technique is nowhere more evident than in those procedures where internal sources of infection are encountered and set free during an operation, as, for instance, in the excision of tuberculous, suppurating joints and glands, in the removal of the diseased appendix vermiformis, the evacuation of the intra-peritoneal abscesses, and the excision of suppurating abdominal tumors. To prevent accidental contamination of healthy surfaces, or, if unavoidable, to neutralize its bad effects, can be truly said to be a newly developed art. I may also mention the enormous progress in the safety of surgical interference in operating upon organs that can never be called aseptic: as, for instance, the rectum; the oral cavity—in fact, the entire digestive tract; the bladder, and the uterus. Here operative technique in the old sense, and antiscpsis or asepsis, are so intimately blended that they cannot be safely separated, and ought to be taught together by book and example.

To illustrate the meaning of these remarks, I may be permitted to mention a few examples. To insure the success of an extensive excision of the rectum for cancer, we perform preliminary colotomy. Thus we divert feces and contamination from the field of operation, rendering it aseptic as far as possible. Likewise we open the membranous portion of the urethra and pass a drainage-tube into the bladder, in order to prevent the infection of a urethroplasty wound by ammoniacal urine. Not long ago, in performing a needful herniotomy upon a boy-child, I have, to prevent the soiling of the wound by urine, performed external urethrotomy with success. All these operations represent improvement of operative technique in a wider sense.

The field we have here touched is one where a clear line of demarcation between aseptic and antiseptic measures cannot be drawn. In many of the cases belonging to this order, *irrigation* is an important element of success; therefore let us devote a few words to the subject of irrigation.

The wholesale condemnation of irrigation as employed in the past is just as sure a sign of superficiality on the part of the critic as the slighting of the important rôle of antiseptic agents in former periods of the antiseptic method. As long as the preparatory measures to an operation were rather perfunctory; as long as the skin, the surgeon's hands,

promptly to germicides than their spores. After this process of fermentation the sponges are thoroughly kneaded by hand, each for a minute, in plenty of hot water and potash or soft-soap, which will thoroughly macerate and mollify hard lumps of dirt that may be imbedded in the densest and central parts of the sponge, thus rendering them, as it were, penetrable to the action of germicides. After all traces of soap are removed, the sponges are thrown into a five per cent. solution of carbolic acid, which I prefer to corrosive sublimate for this purpose, as it does not become inert as easily as a metallic compound. An immersion extending over twenty-four hours will render the sponges absolutely sterile and fit for use. Should it for economic reasons be desired to use sponges oftener than once, this same process will be just as effective to purify them.

The large flat sponges so generally used in laparotomy have been abandoned by me for three years as expensive, and not as handy as small, well-sterilized compresses of plain absorbent gauze, which, to prevent unfolding and fraying, are firmly tied with silk at one end. The surgeon is nowhere so cramped for lack of space as at his operations in the bottom of the pelvis. A sponge used for packing away intestines needs constant pressure to prevent its expansion and encroachment upon available space. A pad of gauze held down for a short while will become packed, and will retain its shape and position even if released from digital pressure.

When I approach the vast subject of *operative technique*, indissolubly connected with the principle of asepticism and antisepticism, I confess to a feeling of helplessness. Hours would be required to do justice to the intimate connection and interdependence of these subjects, and I must content myself with giving you a few glimpses only. The enormous increase in the ratio of safety in operating caused by anti-parasitic measures has led to curious results. A clumsy and rough operator who is a thorough antiseptician is often very successful. On the other hand we see very dexterous men suffer disheartening discomfitures on account of disregard of the maxims of cleanliness. This is not said to encourage clumsy operating. On the contrary, I must declare what all of you know already, that the most brilliant triumphs of surgery are won in these days by those who combine technical skill, the cunning of hand and brains, with the conscientious practice of a thoroughgoing cleanliness. The neglect of cleanliness will meet in no field of human activity with a swifter and more certain retribution than here; hence I may say that cleanliness is one of the most important and truly ethical factors in the honorable pursuit of our noble art.

The barbaric elements of the neglect of cleanliness and inattention to hemorrhage, the rough methods of evulsion, the slashing and tearing,

contents of cysts, or abacteric pus from a ruptured pyosalpinx or ovarian abscess, have accidentally soiled the peritoneum, the simple wiping off of the bulk of these substances is sufficient to eliminate danger; that in these cases irrigation is unnecessary, and that recovery takes place rather in spite than in consequence of irrigation. How entirely useless, nay, pernicious, the effects of flushing the peritoneum are in cases of active septic infection, as, for instance, in the presence of fetid fecal abscesses due to intestinal perforation, has been abundantly demonstrated to myself and to other surgeons here and abroad by numerous unsuccessful attempts. And there is nothing more certain than that, on account of its complex character, the peritoneal cavity cannot be completely washed clean; that germicidal solutions cannot be used in a sufficient strength to be effective, and that finally an inert or weak solution will only help to spread the elements of infection to previously unaffected areas. The substance of these assertions was essentially confirmed by experimental research on animals.¹

I take this opportunity for a short diversion to a subject still discussed by surgeons and deserving some notice. Most operations within the peritoneal cavity afford no very rigid test of the absolute value of the aseptic measures therein employed. The tolerance of the peritoneum is almost incredible, and technical sins committed during abdominal operations against the accepted rules of cleanliness, proper dissection, hæmostasis, go much oftener unpunished than those incurred at an amputation, resection, osteotomy, or the excision of extra-abdominal tumors—in fact, at all major operations performed outside of the belly. But let the limits of peritoneal tolerance once be overstepped and usually the damage becomes irretrievable; the patient generally dies of septic peritonitis, for which there is no adequate corrective. On the other hand, if extra-peritoneal regions manifest less tolerance of slipshod methods, the consequences of surgical shortcomings are here often retrievable by corrective measures of one or another kind. The tolerance of the peritoneum was only too often the mantle of charity under which were hidden from view sins of omission and of commission of laparotomists without surgical training. In laparotomy more than anywhere else the most rigid asepsis is a conscientious duty.

Intimately connected with the change of views respecting preparatory asepticism and irrigation is the shifting of our standpoint regarding the application of *drainage*. Imperfect cleanliness, copious irrigation, and abundant drainage represent the links of a chain forged by necessity. A faultless asepsis has often enabled us to do away both with irrigation

¹ P. Delbet: "Recherches expérimentales sur le Lavage du Péritoine." *Annales de Gyn.*, xxxii. p. 165.

his sponges, instruments, and dressings were indifferently cleansed, the continuous use of disinfectants during and after the operation was necessary to insure success—that is, to ward off virulent suppuration. Similarly, under those conditions, the use of continuous irrigation during operations was justified by the general improvement of results observed after its employment. As we have learned to lay greater stress upon and practice a more exact form of preparatory asepsis, so the necessity for chemical germicides and irrigation has been restricted. But both of these agents have furnished a valuable and necessary link in the chain of development of the discipline. This view is confirmed by the fact that practical experience tells us how indispensable irrigation still is to the safe performance of many operations done in regions which can be rendered and kept aseptic only with great difficulty or not at all. Here, too, the mechanical effect of the stream of irrigating fluid is infinitely more important, in my opinion; than the chemical influence of the weak solutions generally used. It is rather the rush of the fluid washing away impurities than the salicylic or boric acid dissolved in it that is effectual.

Accordingly, we rarely employ irrigation in wounds that are known to be free from infection, and with few exceptions never take strong solutions, the use of which has produced in the past a considerable number of fatal intoxications. By eschewing chemicals we also have seen hæmostasis become easier, and especially have observed that the troublesome oozing of the fresh wound has been almost entirely done away with. Our dressings grew less bulky and cumbrous; they could be left longer undisturbed, and, what is an important item in the amputation of limbs, could be bandaged on with less pressure, whereby the danger of marginal necrosis of the flaps is materially diminished. In short, the dryer the operation, the dryer was the course of healing. How this matter has affected the question of drainage we shall consider presently.

To sum up we shall say, then, that irrigation of an aseptic wound is unnecessary, even harmful; that it should be only employed in wounds which are *per se* not aseptic, such as those in the vicinity of or within the several orifices of the body—as, for instance, the rectum, oral cavity, and vagina; that irrigation is well employed during operations in and about accidentally infected or suppurating areas. *A notable exception to this rule is the abdominal cavity, wherein irrigation is never to be employed.* This statement seems to condemn a widely spread practice, and some courage is needed to express it unreservedly. But both experience and scientific experiment support this view. It will be objected that a vast array of cases is on record wherein irrigation of the abdominal cavity was practised successfully by eminent surgeons. To this we reply, that where harmless substances, as, for instance, blood, non-septic

typhoid, searlatina, and vaccinia, and that it is, therefore, to be looked on rather as a modification of some of the normal elements.

Fischer, of Kiel, examined the blood of eighty subjects of malaria from the Cameroons, West Indies, etc., and Schellong that of a large number of patients in New Guinea, and, since his return to Germany, of cases of recurrent attacks, with none but negative results. It must, however, be borne in mind that the value of negative evidence is at a minimum when the object of the search is new, and only to be detected by special methods of examination and staining demanding much technical skill and practice.

Dr. Plehn, after nine months' preparation as assistant in the Hygienic Institute at the University of Jena, began his observations at the Moabit Hospital in Berlin, on three cases of typical intermittent fever in which the several stages were well marked, the temperature reaching a maximum of 41° C. (105.8° F.) and respectively of the quartan, tertian, and quotidian forms—the last, however, subsequently passing into the tertian. The two former, from Hamburg and Posen, gave negative results, but he was successful in the case of the last, a laborer from Potsdam, who had suffered for two months from severe quotidian ague, for which he had had no medical treatment, having been refused admission to the hospital there from want of room. It is worthy of notice that after this man had been treated with large doses of quinine, and the quotidian had been succeeded by the tertian form, the plasmodia rapidly decreased in numbers and soon disappeared entirely. This may account for the failure of many observers, to say nothing of the paucity of material at the disposal of most compared with the opportunities enjoyed by Italian physicians, among whom Celli and Guarnieri, for instance, have treated as many as 2000 patients in one summer.

In the Potsdam case Plehn found the plasmodia in abundance in all stages of the disease, but especially during the febrile exacerbations. Only the smaller were colorless, the larger being pigmented by granules and rods of melanin irregularly disposed. For the details of his manipulation we must refer to his paper.

In a postscript he states that since going to press he has also found the plasmodia in great numbers in the blood of a recurrent case returned from Sumatra, and that he intended continuing his observations on every opportunity.—*Zeitsch. f. Hyg.*, 1890.

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and drainage. Wounds of a moderate extent, for instance, made in herniotomy, if really aseptic, their dissection clean, and hæmostasis perfect, will behave correctly under an hermetic collodion dressing, and exactly like a subcutaneous injury. The oozing will be very moderate, scarcely penetrating the thin coat of gauze soaked in collodion, swelling none, and after the lapse of ten days we shall find the catgut stitches absorbed and the wound perfectly healed. This is a common observation of modern surgeons and does not need specific verification. The same principle finds a different application in certain operations about the joints and bones, when so-called "dead" spaces must needs be left behind. As most of these operations are done with the aid of artificial anæmia considerable oozing of blood follows the removal of Esmarch's bandage. This blood fills up the irregular cavities left by the surgeon, and, coagulating, forms there a solid aseptic plug, which is gradually consumed and replaced by connective-tissue elements of new formation. For seven years I have abandoned the use of drainage-tubes in those excisions of joints and sequestrotomies where it was possible to remove all diseased tissues in an unexceptionable manner. According to Schede's plan, I have only provided an avenue of egress for the first onrush of oozing blood by leaving one or another angle of the wound somewhat patulous. A film of protective over this little gap will prevent the absorption of the blood needed for filling up the irregular cavity of the excision wound, and will maintain sufficient moisture to prevent the exsiccation of the coagulum.

And even in operations where we are not absolutely certain of the aseptic condition of our wound we can often dispense with the use of drainage-tubes, and not incur any serious risk. Bergmann first demonstrated that a wound of doubtful asepticity can yet be made to heal by primary adhesion. He passed his suture points through the edges of the wound, but leaving them untied, and then packed the open wound and all its recesses down to the bottom with iodoform gauze. Over this was placed the usual outer dressing. Through the capillary action of the gauze copious oozing of serum was encouraged, which in about sixty hours lost its sanguinolent character, whereupon the packing being extracted the suture points left *in situ* were closed, and the wound was seen to heal in a manner little differing from primary union. Undoubtedly, much of the success of this plan of packing and secondary suture is to be attributed to the action of iodoform, which has triumphantly withstood various attacks upon its reputation.

Still another modification of this form of drainage is now extensively employed in abdominal surgery, where, on account of much unavoidable denudation or accidental infection, copious oozing is to be expected. Mikulicz was the first one to employ the iodoform-gauze packing successfully in the abdominal cavity, and his plan has met with widespread

and deserved acceptance. First, it does away with the use of the drainage-tube, and secondly, its contact with the peritoneum causes just enough adhesive irritation to insure after its removal rapid agglutination of the raw surfaces. Immediate closure of the wound can be practised after extraction of the packing. But *drainage by tubes* still remains indispensable where acute progressive suppuration has to be dealt with, as an ample way of egress must be provided for sticky and coherent masses of pus, blood-clot and sloughing tissue.

By touching this subject we have entered the realm of *antiseptis* proper. Let us now consider the comparative value of the principal measures employed for combating active, destructive suppuration, the form of infection which the surgeon has to encounter most frequently. I unhesitatingly declare, and lengthening experience tends only to confirm my conviction, that here as elsewhere, purely mechanical measures employed with a view to the removal of excessive tension and the thorough evacuation of noxious matter, such as adequate incision, properly placed drainage, the extraction of sloughs and sequestra, with frequent energetic irrigation, play a much more important part in checking mischief than chemical disinfection. Even in the treatment of destructive ulcers the constant bath and actual cautery are found to be more effective than chemical applications, though the great usefulness of the latter cannot be denied in milder processes of a superficial character.

We have seen that dry absorbent dressings, favoring rapid evaporation, are most useful in the treatment of extensive aseptic wounds, and that smaller aseptic wounds can be advantageously sealed with an hermetically oclusive collodion pad. An entirely different principle obtains in the dressing of septic or suppurating lesions, surgical or accidental.

While capillary attraction, exerted by a dry absorbent dressing, is perfectly adequate to drain an aseptic wound of its serous discharges and while the rapid drying and crusting of these dressings is just the thing we want to seal a sweet wound against the possibility of subsequent infection from without, these very qualities of the dry absorbent and oclusive dressing make it unfit for use in cases where the secretions are purulent. To begin with, pus contains so many corpuscular elements in the shape of leucocytes and shreds of decayed tissue, all suspended in a more or less viscid medium, that capillary absorption alone cannot effect much more than the removal of a portion of its serous components. The remainder, containing the more solid part of the discharges, becomes inspissated and forms a crust. Thus, artificially, retention and an aggravation of the existing mischief is brought about. A moist dressing, protected against evaporation either by remoistening or an outer covering impermeable to moisture, does not possess these disadvantages. In-

spissation being prevented, the escaping pus retains at least its original density, and is evenly absorbed and distributed through the interstices of the entire dressing. Crusting and retention will be prevented, especially if the dressings are frequently renewed. An additional and very valuable quality of the moist dressing is the soothing effect it exerts upon the inflamed parts. It soon acquires the temperature of the covered region, and the combination of warmth and moisture presents the most valuable features of the time-honored poultice without its drawbacks.

Is the impregnation by germicides of moist dressings used in cases of suppuration effective and necessary, or not? My answer is unhesitatingly negative. While the microbes contained in dense masses of pus will remain unscathed by the minute quantities of a chemical contained in our dressings, these will be very often sufficient to irritate the skin into florid eczema. Adequate incisions, efficient drainage, frequent change of dressings supplemented by irrigation, contain the essence of the successful treatment of suppuration.

In summing up we will say, finally, that though chemical sterilization is still important, and even indispensable in some fields of modern surgery, main stress belongs to those mechanical measures of purification which comprise the essential part of aseptic preparation.

Having passed in review the present status of anti-parasitic surgery we see that, although incisive changes have befallen the means employed, the principle upon which the discipline was grounded remains unshaken. The living spark of truth has survived the pedantry and over-zeal of the advocates, as well as the sneers and contempt of the opponents of the new departure. Its blessings have soothed and removed untold suffering and misery—have saved, I might say, millions of lives. For all this, humanity is indebted to one man, whose intellect pierced the deadly mists that overhung the practice of surgery. That to the activity of the surgeon, though it still remains surrounded by grave responsibilities, was added a vastly increased element of pleasure, the *gaudium certaminis* against disease and death—for this gift to his fellow-surgeons, we are indebted to Sir Joseph Lister.

THE PATHOLOGY OF OPHTHALMOPLÉGIA.

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WHETHER we regard the complexity of the structures concerned, or the rarity of opportunity for post-mortem examination, or the indirectness and consequently secondary character of the evidence on which we accordingly have to rely, the difficulty of the explanation of the pathology of ophthalmoplegia is obvious. Bearing in mind the destination of the third, fourth and sixth nerves, with the second and parts of the fifth and seventh, together with the sympathetic, to the eye and orbital contents, the eyelids and appurtenances; the long and varied course which several of these pursue from their nuclei to their termination in the orbit; the more complicated connections of their centres with the nerve-tracts proceeding from the spinal cord, medulla, and pons, and those proceeding to the cortex of the brain, the varied and extended ocular symptoms which may result from even a small intra-cranial lesion are self-evident. Probably nowhere has post-mortem examination been of less service to pathology than here. We are constrained to rely upon clinical observations, judicious analogy, and certain experiments upon animals, for a rational explanation of the symptoms with which we are dealing. This field of research, common to the physician and the oculist, it is not surprising to find, was permitted to remain fallow until within the last twenty-five or thirty years. The term ophthalmoplegia had been employed by Brunner as early as 1850, and was first brought to the notice of Continental oculists by Von Graefe, who reported a case in 1856, and exhibited a typical example of this disease to the Berlin Medical Society on January 29, 1868. The more modern (1878) division into ophthalmoplegia externa and ophthalmoplegia interna may prove, on further investigation, to be of as little value pathologically as, according to Mauthner, it is perhaps incorrect etymologically.

The site and nature of the lesion to which the group of oculo-motor palsies (for which we employ the term ophthalmoplegia as an equivalent) is due, have been the chief points upon which discussion has taken place. It is obvious that disease affecting the nucleus of origin or the nerve in its continuity or termination, whether such disease be intrinsic or extrinsic, may be productive of results difficult to separate. Disease of the second nerve alone of all cranial nerves is recognizable by

other means than those having reference to disturbance of function. The magnified image of the optic disc exhibiting, in the case of optic neuritis, increased vascularity, lymphatic engorgement, intra-neural hemorrhage, proliferation of fibres, gives us an insight into what may be going on in other nerves during life when they are the seats of neuritis, whose evidence is only rendered visible by the less precise method of post-mortem examination, or inferred by reason of disordered function. It is now well recognized that what is called sclerosis, or some other equally precise, more acute, and more truly inflammatory process, is liable to overrun on definite lines, both centripetally and centrifugally, the cerebro-spinal system, and that the same may be scattered sparsely over the brain and cord, or localized in certain parts. It follows that the symptoms may be as diversified as the sites of this degeneration are various, and it is impossible to understand aright the effects resulting from a lesion affecting the deep origin of any one nerve, or group of nerves; without taking a survey sufficiently broad to cover similar lesions affecting neighboring areas. It was at one time argued that a group of oculo-motor paralyses occurred which was sufficiently distinct from the previously recognized single-nerve palsies or single-muscle palsies, on the one hand, and from symptoms indicating invasion of the spinal cord or brain on the other, to warrant their collection into a separate category, and their being dignified with the exclusive application of the term ophthalmoplegia. This appears to have been the view of Hutchinson when he communicated his paper on "Ophthalmoplegia Externa, or Symmetrical Immobility (partial) of the Eyes with Ptosis" to the Medico-Chirurgical Society in 1879.

He therein states that cases of single-muscle paralysis, occurring in syphilis and in locomotor ataxia, are to be distinguished from the class for which he "ventured to propose the name of ophthalmoplegia externa" upon the three following grounds:

1. By the fact of non-symmetry of the former.
2. By the early completeness of the paralysis.
3. By the ease with which very frequently they are cured.

He, however, admits that symmetry is not invariable; indeed, one of his fifteen cases was unilateral, and several others exhibited less symmetry than mere bilaterality.

As to the absence of early completeness of the symptoms, it may be true that the affection of the various muscles may be progressive, but the invasion may be sometimes sudden, as in his eighth case; and it is difficult to understand why the cause which he suggests of the unilateral and partial category of cases, viz., a gumma in the nerve-trunk, should manifest itself by suddenness of onset.

As to the comparative facility of cure in the two sets of cases, it is difficult to see why he should regard as more unfavorable those he calls

ophthalmoplegiæ, since he says: "The effects of remedies in several cases were very remarkable, the patient having been rescued from a very dangerous condition." And again: "Often it is distinctly influenced for good by treatment."

As showing that the group of palsies which Hutchinson had in view was less capable of sharp separation from the recognized results of similar affections of the neighboring parts, it is important to note that among his fifteen cases, "in six the lower extremities were more or less weak and liable to pain, the condition approaching more or less closely to locomotor ataxia," and several cases exhibited affection of other cranial nerves—*e. g.*, first, fifth, seventh, and eighth—and in two cases there was insanity; and he finally admits that "there can, however, be no doubt that ophthalmoplegia externa is sometimes a part of the general malady known as progressive locomotor ataxia."

The close similarity of these palsies to those spinal palsies common in children, and known as anterior poliomyelitis, has often been remarked, notably by Wernicke, and the term polio-encephalitis superior as opposed to polio-encephalitis inferior, or bulbar paralysis, has been suggested. This would appear to be the view entertained by Ludwig Mauthner in his valuable monograph on the subject, which reviews most of the previous literature and critically investigates the evidence at large.

We have hitherto made no mention specifically of so-called "ophthalmoplegia interna," which has been regarded in this country, in spite of accumulating evidence both physiological and pathological to the contrary, to belong to the category of orbital or peripheral lesions, rather than as of central origin. It is difficult to see *à priori* why, if a central control be allowed for the muscles of convergence, this should be denied to the muscles of accommodation, and, if allowed to the latter, why the same privilege should not of necessity be extended to the muscle of the iris.

In 1878 Hutchinson communicated to the Medico-Chirurgical Society his paper on "Paralysis of the Internal Muscles of the Eye"—ophthalmoplegia interna—a group of symptoms which probably indicates disease of the lenticular ganglion. He then held that if paralysis of the muscles of the iris and of the ciliary muscle alone coexisted the "seat of the disease can be in no other structure than the ganglion itself."

Curiously enough, out of the eight cases he relates, in five both of the eyes were affected. It will appear at the outset that such symmetry would be more easily explicable by a focal lesion in the neighborhood of the posterior part of the third ventricle where the third nerve takes its origin, than by assuming that the widely separated lenticular ganglia should be similarly and synchronously affected. How such symmetry can be comparable to the symmetry of choroiditis, as Hutchinson sug-

gests, is hard to understand. Indeed, it would appear from a footnote, which he added after the paper was read, that he was not well satisfied with the explanation he had volunteered. He says: "My only hesitation on this point is as to whether in some cases the same symptoms may be due to disease near the nucleus of the third nerve. It is not easy, however, in such cases to see why the vasomotor should be affected. I have, however, seen the pupil motionless and accommodation lost in some cases in which the disease was believed to be in this position; always, however, there were other complications."

This last observation appears to be most important and suggestive, and would seem to us to indicate at once the solidarity of so-called ophthalmoplegia interna, not only with ophthalmoplegia externa but also with bulbar and infantile spinal paralysis, so far as the nuclear nature of such lesions is concerned. Hulke, in the first volume of the *Ophthalmological Transactions* for 1880, traversed Hutchinson's lenticular ganglion theory, and suggested in its place disease of the "intra-ocular ganglionic plexuses in immediate relation with the muscular apparatus," as the approximate cause. Andamuk had demonstrated that after removal of the lenticular ganglion stimulation of the cervical sympathetic produces the usual dilatation of the pupil. This "appeared to be absolutely decisive" that there was a route from the sympathetic to the iris not *via* the lenticular ganglion. Hulke's preference for the ganglionic plexuses may be accounted for by his claim to have discovered these bodies coincidently with Müller and Schweigger in 1858.

Hutchinson, in reply to Hulke, thinks, "so far as the choice lay between a central and a peripheral seat of change, Mr. Hulke and myself are in the same boat." Gowers, who followed, suggested that they might both be in the wrong one, and taking a broader view and following the researches of Hensen and Volkers, he regarded the probable seat of the lesion as being the anterior portion of the nucleus of the third nerve.

The researches here referred to, carried out in 1878, upon dogs, went to show that the most anterior portion of the nucleus of the third nerve at the posterior part of the third ventricle was the centre for accommodation; behind this came the centre for the iris, then that for the internal rectus, and posteriorly the other muscles of the eyeball. Kohler and Pick's clinical researches powerfully support the foregoing observations, while slightly varying the arrangement of the posterior portion of the nucleus, the internal part of which they would devote to the interior and inferior recti, the outer portion comprising the nuclei for the levator palpebræ, the rectus superior, and the obliquus inferior. Both sets of observers agree in regarding the centre for the fourth nerve as practically part and parcel of that of the third, to the posterior extremity of which it is immediately adjacent. The nuclei of the sixth

appear a little further back, close to the median fissure and the olivary fillet. There is reason to believe that a path of connection between the sixth nucleus of one side and the third nucleus on the other is provided by the posterior horizontal fibres, a nexus which appears at once to explain and to be supported by the facts in regard to what is known as conjugate deviation.

It is well to note here that the recent researches of Gaskell led him to regard the lenticular ganglion as the vagrant motor ganglion of the third nerve akin to the sympathetic ganglion connected with the motor root of a spinal or segmental nerve, and composed almost entirely of third-nerve fibres. He does not regard the first division of the fifth nerve as their corresponding sensory nerve, but finds in the third and fourth trunks fibrillar tissue and cells which he considers to be the vestigial remains of long disused sensory roots and sensory (stationary) ganglia of these nerves. If this view be correct, it is doubtful whether reflex central functions can be attributed to the lenticular ganglion with any more assurance than they can be to the submaxillary ganglion. It would appear to be little more than a vestigial incident occurring in the course of distribution of the third nerve, and not to be regarded either as the primary or secondary seat of control of the intra-ocular muscles.

We have hitherto made no allusion to neural as distinguished from nuclear lesion as occasioning ocular palsy. In 1883, in *St. Bartholomew's Hospital Reports*, one of the present author's, in recording thirteen cases of oculo-motor paralysis exhibiting great variety of both unilateral and bilateral palsy, thus recorded his view of the pathology of these cases:

"In those cases where periostitis in the form of nodes or gummata was present, it is probable that the lesion was situated in the orbit or the sphenoidal fissure. In those cases of *bilateral paralysis*, especially when there is implication of the optic nerves, the base of the brain or the central ganglia are presumably the seat of disease."

In apportioning the effects of extrinsic (*e. g.*, tumor or aneurism exciting pressure), or intrinsic (*e. g.*, nucleitis or neuritis) causes it is important to bear in mind, as Mauthner insists, that we may speak of three categories of causation according to the proximity of the cause. Thus syphilis may cause tumor which may cause ophthalmoplegia. Here nerve-pressure is a cause of the first category, the cause of the proximate cause is the tumor, and the remote cause of this is syphilis. The relative irrelevance of the remote cause as compared to the proximate cause is obvious, yet its importance therapeutically is paramount.

In no other situation are there opportunities for a small lesion to affect so many cranial nerves in their continuity as in the cavernous sinus. Putting aside the rather obscure ocular palsies of cortical origin,

the floor of the aqueduct of Sylvius and fourth ventricle and the walls of the cavernous sinus would be the most favorable site for small lesions to effect large results; in the former such lesions would be mostly nuclear, in the latter necessarily neural. We would here introduce the following scheme:

OPHTHALMOPLÉGIA.

- I. *Cerebral.*
- (a) cortical { conjugate deviation.
 { hemi-ptosis (?).
 { hysterical ophthalmoplegia (?).
 - (b) cortico-peduncular.
 - (c) nuclear { 1. cycloplegia } "ophthalmoplegia interna."
 { 2. iridoplegia }
 - 3d nerve { 3. palsy of extra-ocular muscles.
 ptosis.
 - 4th nerve 4. palsy of superior oblique.
 - 6th nerve 5. palsy of external rectus.
 - (d) radicular (and ? commissural).
- II. *Basal.*
- (a) region of pons (vi.).
 - (b) " " peduncles (vi. iv. iii.).
 - (c) " " cavernous sinus (vi. iv. iii.).
 - (d) " " sphenoidal fissure.
- III. *Orbital* (including peripheral).

Ophthalmoplegia of cortical or cortico-peduncular origin is usually conjugate, not unilateral; this is a corollary to the observation that movements; rather than muscles or nerves, are represented in the cortical colligation. The only exception to this rule apparently is that of ptosis occurring upon the opposite side exclusively to that of the cerebral lesion. (Landouzy.)

In order to complete the cerebral classification of intra-cranial sites of possible lesions resulting in ophthalmoplegia, it is necessary to add the "radicular," to include lesions intermediate between the superficial and deep origins of the various nerves concerned, and perhaps also commissural.

In addition to intra-cranial causes, there are those situate in the orbits, which logically should be made to include the so-called peripheral lesions, which some authors would place in a separate category. It is difficult to deny that in some cases of transient ptosis, symmetrical cyclopareisis, convergent asthenopia may not be of peripheral neuromuscular causation; and it is certain that trauma may be productive of peripheral palsies, whether by extravasation or by more permanent sequelæ.

With a view to elucidate from a clinical standpoint some of the questions we have raised in what has preceded, we have been at some pains to collect and classify such available cases of ophthalmoplegia in English literature as would lend themselves to such treatment. We have

kept apart those cases in which paralysis of the intrinsic muscles of the eye only existed—twenty-one in number—and the heads of classification we have adopted have been the following:

1. Sex.
2. Age.
3. Alleged cause.
4. History, personal and family, with duration and cause of symptoms.
5. Seat of lesion as found, or presumed or inferred.
6. Symptoms, including the muscles paralyzed, vision, headache, condition of pupils, reflexes, optic discs, etc.
7. The treatment.
8. The result.
9. The autopsy in the rare instances in which such has been made.

Sex. Of 120 cases of ophthalmoplegia 73 were males, 39 females, 8 unstated, giving 65 per cent. of the stated cases as males, showing a considerable preponderance in the male sex.

Age. Of the 120 cases, in 111 the age was stated. From 0 there were 8 cases; from 10 there were 17; from 20 there were 26; from 30 there were 28; from 40 there were 19; from 50 there were 6; from 60 there were 4; from 70 there were 3; from 80 and upward there were 0; with 9 not stated = 120.

This summary, in the absence of the number of the population living at each decade, of course tells us nothing as to the actual age-incidence of the disease; but, inasmuch as the population living at each ten years' period is less than that at any previous ten-year period, it proves that the increasing number of cases up to between 30 and 40 indicates a greatly increased liability to the disease up to that age. The fall to 19 in the next period—40 to 50, if viewed in relation to population living at such age—would not show any such considerably reduced liability to attack at that age as probably does occur at the ages beyond fifty.

Syphilis as a cause. In 40 cases out of the 120 there was some evidence or other of syphilis apart from the ophthalmoplegia, or in 33 per cent. of the whole. Of the 40 the result in 32 was stated. In 23 there was improvement under treatment, 11 recovered, and in 9 others the improvement was stated to be considerable and substantial; in 7 there was no improvement, 1 was said to be progressive, and 1 was known to terminate fatally. On these facts we would remark that, while quite agreeing with Mr. Hutchinson that a more careful search for evidence of syphilis might most probably have revealed its presence in a larger number of cases, the disease, even in its central form, is probably not exclusively syphilitic; but if syphilitic, and if unaccompanied by other more serious central disease, and especially if treated early, is apt to be very amenable to remedies.

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DIETETIC NOTE.—A fruit and vegetable diet is most favorable for patients with chronic rheumatic troubles.

Allowed.—Beef and mutton in moderation, with horse-radish as a relish; fish

and eggs, green vegetables and fruit, especially lemons. The skimmed milk diet has been advocated by some authors.

Avoid.—Starchy and saccharine food; all malt liquors, wines and coffee.

These Dietetic Notes have been bound in the form of small perforated slips for Physicians to distribute to their patients. Mailed gratis upon request, together with our latest compilation of case reports and clinical observations, bearing upon the treatment of this class of Diseases.

LAMBERT PHARMACAL COMPANY,

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REVIEWS.

DIE PEPTONE IN IHRER WISSENSCHAFTLICHEN UND PRAKTISCHEN BEDEUTUNG: STUDIEN ZUR LEHRE VON DER VERDAUUNG DER EIWEISSKÖRPER UND DES LEIMES. Von DR. V. GERLACH. Hamburg und Leipzig: Leopold Voss, 1891.

THE PEPTONES: THEIR SCIENTIFIC AND PRACTICAL SIGNIFICANCE. STUDIES TOWARD THE KNOWLEDGE OF THE DIGESTION OF THE PROTEID BODIES AND GELATIN.

THIS interesting publication of a series of original investigations, made partly at the physiological laboratory of Professor Kühne in Heidelberg and continued at the hygienic department of the laboratory of Dr. Schmitt in Wiesbaden, begins with a historical review of the development of our knowledge of digestion and nutrition, and then dwells on the present views on this subject. The splitting up of the albumin molecule into the anti- and hemi-groups of Kühne and Chittenden, and especially the formation of the albumoses, are freely commented on. The amounts of nitrogen and anti-albumin and anti-peptone, also hemi-albumose and hemi-peptone, as found by Kühne and Chittenden, were gone over by the author, and pure albumoses and pure peptone produced by him. With these latter he made further studies on their nutritive value on animals by controlling the nitrogen ingested and that eliminated. In this manner he proves that the albumoses are quite able to take the place of meat as proteid food; further, that they are well borne by the animals and readily taken by them. With the pure peptones he could not determine any results, as they invariably disagreed with the experimental animals. He also prepared gelatin absolutely free from albumin, and from it gelatin-peptone. He determined the amount of nitrogen in this also, and made a series of nutrition experiments with it, both alone and together with meat. He found here that with gelatin-peptone alone there was a steady loss of body nitrogen, so that it does not possess nutritive qualities sufficient to take the place of meat; but when fed with meat together, it increased the body nitrogen over the simple meat diet. Thus he claims to prove that, though no substitute for meat by itself, it brings about a saving of the latter when fed with it.

The practical application of the author's investigations is in connection with the estimation of the food value of the so-called "meat peptones." He arrives at the conclusion that, as they are principally composed of albumoses and of gelatin- (chondrin-) peptones, they are valuable substitutes for albuminous diet, quite able to take their place, and by comparison and comparative experiments with a number of them, claims the greatest food value for the "Kemmerich's meat peptones."

L. W.

Eye affected. Of 109 cases, 1 eye only was affected in 61 cases, both eyes in 48. In the 61 cases in which only one eye was affected, this was the right in 31, the left in 30; showing that the side affected is a matter of indifference. The above figures, of course, destroy the importance attached to the symmetry of the lesion. Our cases include many in which the affection was in the nerve-trunks, but in some of these the palsy was bilateral; and we think far too great importance has been attached to the question of symmetry as deciding the seat of the lesion.

Distribution of the palsy as regards various portions of third nerve. Of the 120 cases of ophthalmoplegia in which the external ocular muscles were affected, there was evidence of some affection of intra-ocular muscles in 65.

In 29 of the 65 both iris and ciliary muscle were involved.

We would, however, direct especial attention to the mode of linking of extra-ocular palsy with cycloplegia and indoplegia respectively as bearing upon the work of Heusen and Volker and of Kohler and Pick.

In the 34 cases in which only one of the two (viz., iris or ciliary) was affected, plus extra-ocular palsy, in no less than 31 it was the iris and not the ciliary, and in only 3 was it the ciliary and not the iris. If it be true that the centres for ciliary, iris, and extra-ocular muscles are arranged in that order—tandem fashion—on the floor of the aqueduct, we can understand why the linking of the palsies should be as above.

Distribution of palsy as regards nerves involved. Of the 116 cases in which the analysis could be made, in 47 the third nerve alone was affected (in 18 complete, in 29 incomplete); in 42 the third, fourth, and sixth were affected in company; in 11 the sixth alone was affected; in 8 the third and fourth failed together; in 4 the third and sixth are presumed to have been associated in palsy; in 2 the fourth and sixth, and in 2 the fourth alone.

The frequent bracketing of the third, fourth, and sixth might suggest the frequency of lesion in the course of the nerve-trunks; but the relative infrequency of attack of the sixth, in spite of its longer and more arduous extra-cerebral, intra-cranial course, would rather suggest an opposite reflection. The direct connections between the sixth nuclei and those of the third and fourth by the posterior horizontal fibres are to be borne in mind.

Result. Of the 92 cases out of the 120 in which the result is noted 53 improved under treatment, 26 completely recovering, and in 14 more the improvement was stated to be considerable; in 15 there was no improvement, in 2 the disease was progressive, and in 22 it was fatal.

Age and fatality. We have previously suggested that ophthalmoplegia of young children was probably more serious and fatal than that of adults. Of 6 cases under ten in which the result is recorded, 3 died, or 50 per cent.; of the 86 over ten in which the result is recorded, 19 died, or 23 per cent.

separate chapter. The author assigns them a secondary position in the treatment of this disease, particularly because of their depressant heart action. He prefers quinine for occasional use in grave hyperpyrexia, unless there is great cerebral excitation, when antipyrine does better. A description of Brand's method of cold-water treatment is appended.

G. E. S.

LECTURES ON DIABETES; INCLUDING THE BRADSHAW LECTURE DELIVERED BEFORE THE ROYAL COLLEGE OF PHYSICIANS, AUGUST 18, 1890. By ROBERT SAUNDBY, M.D., F.R.C.P., Lond., etc. 12mo. pp. 232. New York: E. B. West & Co., 1891.

THERE can scarcely be a more difficult part in the rôle of medical authorship at the present day than to write a satisfactory book on diabetes. It is a disease that has long been known; an enormous number of clinical facts has therefore been accumulated bearing upon it, while no department of physiology has had added to it so much accurate experimental knowledge as the glycogenic function of the liver; yet we know neither the cause nor pathology of diabetes. As much as is known has been known a long time, and whenever a new book is announced the reader naturally expects more than he receives.

Each carefully collated volume, however, adds to the stock of knowledge whence we must some day extract the kernel of a solution of the vexed problem. Dr. Saundby's book is no exception. The direction in which he has efficiently aided us is in the geographical distribution of the disease and in its morbid anatomy. In the former respect his work is complementary to the equally excellent book of Dr. Purdy, of this country. Dr. Saundby's book is especially complete in this direction so far as Europe and Asia are concerned, while it is signally deficient in the American distribution. On the other hand, Dr. Purdy's account of the distribution of the disease in America is by far the most complete and exhaustive yet published, and he who follows will have the advantage of their joint labors. The most important result of Dr. Purdy's observations is, that the disease is peculiarly prevalent in our northwest and northeast, and hence the conclusion that cold and dampness are important factors in production; and Dr. Saundby's, that the disease is very common among the educated and learned class in India—chiefly non-flesh-eaters. Dr. Saundby has collected many individual cases bearing upon the etiology, but it cannot be said that they add much to what was previously known.

The second feature of Dr. Saundby's book by which it is to be distinguished from others is the exhaustive treatment of the morbid anatomy, no surprise to any one who had the privilege of hearing Dr. Saundby's Bradshaw Lectures, as happened to the writer. The most hopeful organ in this direction at the present day is the pancreas, since not only are there constantly being added to the original cases of Langerhans others wherein the autopsy after diabetes has disclosed pancreatic disease, but there are now also to be added cases of diabetes consequent on extirpation of the pancreas, not only in animals but also in man. The presence of well-defined cases, however, in which there has been no pan-

TEXT-BOOK OF MEDICAL JURISPRUDENCE AND TOXICOLOGY. By JOHN J. REESE, M.D., etc. Third (revised and enlarged) edition. Philadelphia: P. Blakiston, Son & Co., 1891.

THE third edition of this well-known work needs scarcely any comment at our hands. It has been so fully and favorably dwelt upon in THE JOURNAL at its former appearances that but little more can be added now. That it is a standard work of American medical literature is not saying too much for it, also that it is a thoroughly reliable guide for the practitioner if called upon to define his position in the judicial forum.

To the student of medical jurisprudence and toxicology it is invaluable, as it is concise, clear, and thorough in every respect. The absence of cumbersome quotations enhances its value.

If any fault were to be found with it, it would be of quantity, rather than quality. Thus, with somnambulism and other conditions of irresponsibility, the question of hypnotism might have been considered in this edition.

The additions especially valuable in the present revision are the chapter on the Ptomaines and Formad's investigation and technique for the restoration and measurement of blood-corpuscles. L. W.

THE MODERN ANTIPYRETICS: THEIR ACTION IN HEALTH AND DISEASE. By ISAAC OTT, M.D., Ex-Fellow in Biology, Johns Hopkins University; Ex-President of the American Neurological Association; Consulting Physician to the Easton Hospital; Corresponding Member of the German Medical Society of New York, etc. Pp. 52. Easton: E. D. Vogel, 1891.

IN this little volume a preliminary chapter is devoted to an account of original work on the nature of fever. The author's position is that fever, though primarily set up by an increase in heat-production beyond that of heat-dissipation, continues not from excessive production, but from an altered relation between production and dissipation. This is corroborated by experiments on the dog, and by the use of a calorimeter made large enough to hold a man. A detailed record, among others, is given of the study of a malarial paroxysm made with this apparatus, which is described and illustrated. The amount of heat produced by muscular exercise was also investigated.

After a short reference to the chemistry of antipyretics, their general action in health and disease is considered. The conclusion is reached that in fever antipyresis is usually set up by a temporary decrease of heat-production beyond that of dissipation.

Under the head of therapeutics, these drugs are discussed separately as to their physiological action, toxicology, and clinical use. In a few pages much information is condensed which has not been readily accessible.

The value of antipyretics in typhoid fever receives consideration in a

portant theories as to the part played by them in Nature's economy; especially in their relation to the commoner fermentative, putrefactive and diseased processes." The result of the author's efforts is a more full work of the sort than any with which we are yet familiar in the English language. The arrangement is very similar to that of Löffler's *Vorlesungen*, and at the end of each section there is placed a series of references to the more important works upon the subject just treated. To one interested in the development of bacteriology, and in its present condition, this book will be of value as containing a fairly extensive epitome of what is known, and especially for the facilities given for further reading upon the subject.

H. C. E.

THE LATIN GRAMMAR OF PHARMACY AND MEDICINE. By D. H. ROBINSON, Ph.D., Professor of Latin Language and Literature, University of Kansas. With an Introduction by L. E. SAYRE, Ph.G., Professor of Pharmacy in, and Dean of, Department of Pharmacy, University of Kansas. Pp. 271. Philadelphia: P. Blakiston & Co., 1890.

A CURIOUS outgrowth of the modern tendency to narrow specialism in education is this volume, which is designed for the use of those whose limitations compel a short preparation only for the practice of medicine or pharmacy. Somewhat in the form of a beginner's Latin book, it aims to use words and examples in teaching which will serve to familiarize the student from the start with medical and pharmaceutical terms.

It must be confessed that it is startling at first to find, instead of the traditional and familiar sentences about Balbus or Romulus or the she-wolf, such exercises for translation as these: "Is the syrup of ipecac a good remedy for a bad boy?" "What is on our friend's nose? A capsicum plaster." "Nitric acid bit the boy's third finger." Truly, this is a utilitarian age. While it must be admitted that under ordinary methods a considerable vocabulary is acquired which cannot be directly applied in pharmacy or medicine, there may be an error in the other direction. Large numbers of technical words, as names of drugs, are transferred almost bodily into English. There is little advantage in being familiar with them as words simply, when their meaning is unknown to the beginner, while the use of unwieldy terms would seem to make more embarrassing than ever the Latin construction. After all, a vocabulary can best be acquired by associating a word with an object or its use.

There is much in the exercises here given which can only be of use to students of pharmacy, and it is probable that among these the work will find its chief field. For instance, one of the exercises to be translated into Latin consists of the formula and the method of preparing the compound fluid extract of sarsaparilla. It is doubtful whether there is any practical improvement upon a narrative of the Romulus and Remus type in the translation of the following: "Moisten the powders with twenty ounces of this mixture, and pack it firmly in a cylindrical percolator."

Granted that his whole knowledge is superficial, the question arises

creatic lesion, and of others where the disease followed blows on the stomach or other localities where the semilunar ganglion could be reached, goes to show that it is likely to be the sympathetic system of nerves which is really responsible even in pancreatic cases.

One turns naturally in every new book to the treatment of such an intractable disease as diabetes. It cannot be said that Dr. Saundby helps us greatly, but at the same time the old treatment is well reviewed and the chaff thoroughly sifted from the grain—and it must be said there is a good deal more of the former than the latter. The dietetic treatment remains the best, while opium is the only adjuvant in the shape of a drug which can be relied upon.

Dr. Saundby's book is welcome to our shelves as reflecting the most recent information on the subject, and as a safe guide to the practitioner for the management of any cases which may come under his care.

J. T.

PRACTICAL PATHOLOGY AND MORBID HISTOLOGY. By HENEAGE GIBBES, Professor of Pathology in the University of Michigan, etc. Illustrated with Sixty Photographic Reproductions. 8vo., pp. xvi., 320. Philadelphia: Lea Brothers & Co., 1891.

THE book is divided into four sections: Part I., Practical Pathology; Part II., Practical Bacteriology; Part III., Morbid Histology; Part IV., Photography with the Microscope. The subjects included under the different sections are as well treated as could be the case in the limits allowed. We are unable to agree, however, that "such instructions are given as will enable him (the student) to transfer a specimen of any morbid change directly to his microscope in an unaltered condition, and to recognize it unerringly." Such a result can only be obtained with a much more exhaustive volume than the one here spoken of. It is an omission to have made no mention of the Koch-Ehrlich method of staining the bacillus of tuberculosis—for this method is one that every student should at least be familiar with.

Taken as a whole, the volume will very well carry out its purpose—that of an aid to the student—and the typography and its illustrations are extremely good.

H. C. E.

BACTERIA AND THEIR PRODUCTS. By GERMAN SIMS WOODHEAD, M.D. Edin., Director of the Laboratories of the Conjoint Board of the Royal College of Physicians (Lond.) and Surgeons (Eng.), etc. With 20 photomicrographs, and an appendix giving a short account of bacteriological methods, and a diagnostic description of the commoner bacteria. 8vo., pp. xiii., 454. London: Walter Scott, 1891.

THIS book is, in the language of the preface, "an attempt to give some account of the main facts in bacteriology, and of the life-history of the bacteria and closely allied organisms, and also to discuss the more im-

gation of Friedreich's Ataxia; Notes of Three Additional Cases of Friedreich's Ataxia.

It must not be supposed that the work is, as its name implies, a mere collection of pictorial illustrations of disease. The plates are certainly its most striking feature, both on account of the excellence of their execution and their truth to nature, but they are, after all, but the complements of a verbal description, in every instance admirable, of the subjects they represent. Without the plates the work would take rank as a standard on the subjects of which it treats; with them, it does away with those false conceptions which are sure to arise in the mind of the mere textualist. We cannot recommend this Atlas too strongly, especially to teachers and to those who are deprived by absence from great medical centres of many clinical advantages; but in mentioning these two classes of physicians we do not exclude anyone who has it in his power to obtain the work.

F. P. H.

TEXT-BOOK OF HYGIENE. By GEORGE H. ROHÉ, M.D., Professor of Obstetrics in the College of Physicians and Surgeons, Baltimore, etc. 8vo. Second edition, revised and rewritten. Philadelphia: F. A. Davis, 1890.

A BOOK whose purpose is to teach men how to live long is always welcome. In these days of wonderfully rapid development of the science of hygiene, when only those skilled in bacteriological research can keep pace with its march, it becomes an urgent need to have a book in which the practical results of so much progress are stated in a clear and concise form, intelligible to the ordinary practitioner and student, as well as to the laity. This purpose is certainly filled by the present work. "The author cannot flatter himself that much in the volume is new. He hopes nothing in it is untrue." With this apology, he certainly deserves credit for the clear-cut manner in which he handles the important sanitary problems. In twenty-two chapters the various departments of hygiene are treated in a manner that embodies in practical application all that the later development of bacteriology has taught us. Especially commendable are the chapters giving a concise but pointed description of contagion, infection, and the use of antiseptics, deodorants, and disinfectants. Prophylaxis, *in place*, has been given due importance, and the accurate and comprehensive description of the Quarantine Station, as established and conducted by the Louisiana State Board of Health, is a valuable addition to the merits of the work, giving the student and practitioner the application on a gigantic scale of the principles which he is called upon to use in daily practice, should he wish to be abreast of the times in the fight against infection and contagion. On the whole, we believe that the author's purpose has been fully achieved, and that this volume, though not an exhaustive treatise, is called to furnish much valuable knowledge in a most accessible form.

E. L.

whether a man is more likely to write correct prescriptions after learning the declension of *adeps* rather than that of the time-honored *rex*.

The book, which stands alone in its field, is written by a teacher who has been obliged to confront the difficulties caused by poor preparation among students. The general plan is undoubtedly the outgrowth of his experience, and as such deserves respectful consideration. While the method utterly divorces the language from its literature and cuts off the comparative study of other languages, it is conceivable that it should help the short-term student to a working knowledge. Though in the individual case it may serve a purpose, its adoption in a school could not fail to maintain a low standard.

It seems a mistake to advise the so-called Roman method of pronunciation. If ever the English method is justifiable it is here, since all scientific terms are Anglicized. Why, for instance, teach a student of pharmacy to pronounce *gentiana* with "g" as in "give," or *cinnamomum* with "c" as in "cave." "Yalapa" for *jalapa* strikes one as odd, even in this book of incongruities.

A useful feature is the frequent giving of simple derivations of compound words, including many of Greek origin. The word *ὕδωρ*, water, looks unnatural when spelled "hudor," but the end of simplicity is attained.

G. E. S.

A MANUAL OF DISEASES OF THE NOSE AND THROAT, INCLUDING THE NOSE, NASO-PHARYNX, PHARYNX AND LARYNX. By PROCTOR S. HUTCHINSON, M.R.C.S., Assistant Surgeon to the Hospital for Diseases of the Throat. With Illustrations. 12mo. pp. x., 127. London: H. K. Lewis, 1891.

A FAIRLY good primer with a good index. Upon 124 pages no less than 64 subjects noted in the table of contents are summarized, with 38 illustrations, and some of them large ones. Ten pages concerning paralyses of the larynx are by far the best of the batch. The illustrations are excellent. A novel departure is presented in sandwiching the subject-matter between three terminal pages devoted to diseases of the larynx in the lower animals, and two full-page initial display plates illustrating morbid growths of the larynx and trachea in dogs, and atrophied muscles of the larynx of a "roaring" horse.

J. S. C.

ATLAS OF CLINICAL MEDICINE. By BYROM BRAMWELL, M.D., F.R.C.P. Edin.; F.R.S. Edin.; Assistant Physician to the Edinburgh Royal Infirmary, etc. Volume I., Part I. Edinburgh: T. & A. Constable, 1891.

THE contents of the first instalment of this work, which will probably soon be widely known as *Bramwell's Atlas*, are: Myxœdema; Clinical Investigation of Cases of Myxœdema; Sporadic Cretinism; The Clinical Investigation of Cases of Sporadic Cretinism; Myxœdema and Exophthalmic Goitre Contrasted; Friedreich's Ataxia; The Clinical Investi-

same, or decreasing a very little. His medicine was only given *sextis horis* at the end of the first week. He suffered a good deal with headache, which was relieved by the salicylate and by citrate of caffeine. By the middle of the second week he was on strict diet, gluten bread, almond cakes, etc., with no starch or sugar in any form. His urine was greatly improved, only three pints being passed in the twenty-four hours, of specific gravity 1024, and containing by Dr. Oliver's test a little over five grains to the ounce. His thirst was lessening, headache had vanished, and his sense of satisfaction with both meat and drink was increasing. About the twelfth day of treatment he was passing about two pints of urine, of specific gravity 1014, with a mere trace of sugar. In six more days there was no sugar at all in his water. On April 10th, having been without medicine for four days, passed about half a pint more water daily, and had suffered from a slight return of the headache. On May 18th had been again off the salicylate mixture for three days, with the result that he passed just twice as much water daily as he had done before. He complained also a little of pains in his back when without the medicine. Since May 19th his water had never been over two and three-quarters pints; it had never contained any trace of sugar; and on June 24th it was acid, specific gravity 1025, no albumin or sugar.

When the patient was on a mixed diet at the very beginning of treatment, salicylate of sodium made a difference of nearly two pints per diem in the amount of water passed; again, when he was on strict diet, the temporary cessation of the medicine on two occasions caused him each time to pass nearly double as much water as he did before or since, and gave him much uneasiness and more desire to micturate.

It may be due to the salicylate that the urine became free from sugar and kept so; it is, however, to be borne in mind that the effect of diet in some cases is marvellous, and the case cannot be considered as cured until the patient has been without the medicine again for some considerable time, and has had a mixed diet without showing evidence of glycosuria.

The action of salicylate of sodium in this case is well worth recording; the more of such cases which are known the more encouraging this method of treatment will be.—*Practitioner*, No. 278, 1891.

THE TREATMENT OF EPILEPSY BY THE COMBINED USE OF BROMIDES AND SOME AGENT CAPABLE OF PRODUCING ANÆMIA OF THE NERVOUS CENTRES.

POULET'S conclusions, as given in the *Bulletin général de Thérapeutique*, are as follows:

The bromides constitute the basis of the treatment of epilepsy. Among them the bromide of gold does not possess the advantages ascribed to it by some, and must yield the palm to the bromide of potassium. There are always a number of cases of epilepsy which though benefited by bromide treatment are not as efficiently treated as they admit of being.

In such cases the addition of one of the following drugs—Calabar bean, picrotaine, belladonna, and, in cardiac epilepsy, digitalis—will frequently bring about the desired result, viz., the suppression of the attacks. This will

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

REYNOLD W. WILCOX, A.M., M.D.,

PROFESSOR OF CLINICAL MEDICINE IN THE NEW YORK POST-GRADUATE MEDICAL SCHOOL;
ASSISTANT VISITING PHYSICIAN TO BELLEVUE HOSPITAL.

SALICYLATE OF SODIUM IN THE TREATMENT OF DIABETES.

The treatment of diabetes mellitus by salicylate of sodium is by no means novel. Speaking generally, there are two great classes of diabetics. In the first are those on whom the disease falls while they are quite young, with symptoms of great intensity; as a rule, to which at present there are very few exceptions, this form is quickly fatal. The second class includes those who are attacked when they are elderly and of gouty tendencies. In these it may not be very active; they may even become fat while they are suffering from it; they have not much glycosuria or polyuria, and they often do not die from the diabetes itself.

DR. MANSEL SYMPSON reports a case where the salicylic treatment was successful in the more fatal class of cases, that is in the younger and more fatal form. The patient was an engineer's apprentice, seventeen years old, who came under Dr. Sympton's care on April 18, 1891. The family history was not good; he had been a fairly healthy lad until about six weeks before. The urine was very pale, greenish-yellow in tint, limpid, also smelling of apples, very acid, of a specific gravity of 1040, free from albumin, but giving a great deal of sugar. He was passing about seven pints in the twenty-four hours. He was at once put on a mixture of ten grains of salicylate of sodium, five drops of tincture of nux vomica, and an ounce of infusion of gentian, to be taken every four hours. He was also cut off absolutely from sugar, pastry, bread (save well-baked toast), and biscuits, and of course from potatoes and starchy vegetables.

In the first week his water became gradually reduced in quantity, from seven to five and a quarter pints in the twenty-four hours, while its specific gravity varied from 1050 to 1040, the amount of sugar remaining about the

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hold in general for epilepsy, pure and simple, as well as for many cases of Jacksonian epilepsy, though in this latter disease the search for the exciting cause, and its removal where possible, must always precede the above palliative treatment. In cardiac epilepsy twenty-four to thirty drops of the tincture of digitalis, or about four grains of the powder may be given along with the bromides.

ANTIPYRINE IN THE TREATMENT OF PLEURAL EFFUSIONS.

CLEMENT, in the *Lyon Medical*, commends the value of antipyrine in the treatment of acute and chronic pleural effusions. The drug to be effective must be given in doses of about fifteen grains every four hours, and continued in somewhat smaller doses for several days after the disappearance of the effusion, a result which he states may be expected in from one to four days. Purulent or bloody effusions are not favorably affected, and when the pleural cavity is completely filled, Clement prefers immediate resort to paracentesis. He is at a loss to explain this singular effect of the drug upon any other ground than its specific action upon inflammatory processes, the kidneys or skin never having shown sufficient over-activity to account for the rapid subsidence of the effusion.

DEATH UNDER METHYLENE.

DR. EDWARD CHAMBERLAYNE recently administered methylene for an operation for the removal of a cancer of the breast. It was slowly given in a Junker's inhaler, and the inhaler was removed from time to time. Besides the supply of air through the valves of the inhaler, there was a space, owing to the falling in of the cheeks, easily admitting the tips of two fingers, on each side of the mouth between the mouth and the inhaler. All went well until about twenty minutes after the administration was begun, when the patient began to heave as if to vomit. The apparatus was at once removed; the heaving lasted a minute and a half, after which she made several deep inspirations of air. A moment later respiration suddenly ceased. Artificial respiration was instantly begun, and kept up for an hour and twenty minutes; it was then decided that the case was hopeless. Six injections of ether and three enemata of brandy had previously been used. About three drachms of methylene were used. There was no post-mortem; her heart had been frequently examined by her medical attendant, and was believed to be healthy. —*Lancet*, 1891, No. 3548.

A NEW ANTISEPTIC.

No sooner is one antiseptic chemical rejected by some disappointed disciple of antisepticism, than he is greeted by a new chemical possessing all the virtues and free from all the vices of its predecessor. DR. BERLIOZ now presents to the Parisian Academy of Medicine a new chemical which already has proved itself worthy, if we accept the statements of its advocates, of general recognition as the best of antiseptics. He names it "Microcidine" — a name to which it is hardly entitled, seeing that its germicidal powers are inferior to those of corrosive sublimate.

According to Professor Polaillon, the new drug is not a definite chemical

compound, but rather a mixture of β -naphthol and hydroxylate of sodium. This new product is soluble in three times its weight of cold water, the solution being of a brown color, which disappears on dilution. The chief advantages claimed for this, the latest of antiseptics, was its slight cost and its non-poisonousness. As it is eliminated by the kidneys, it should be found useful in cases of chronic cystitis with fetid urine. The value of the naphthols α and β in the tympany of typhoid is well known, and as microcidine is simply a product of the fusion of β -naphthol with the hydroxylate of sodium, it should prove useful in such cases.—*Medical Press*, September 16, 1891.

THE TOXIC DOSE OF OIL OF TURPENTINE.

The daughter of a former Hawaiian missionary states that the natives are so fond of drink that the native house-painters will drink oil of turpentine for its intoxicating effect when they are unable to obtain any other stimulant. They have been known to drink as much as a pint at a time. From this statement it would appear that the toxic dose of this substance is far beyond any dose dreamed of by therapeutists.—*New York Medical Journal*, 1891, No. 25.

A NEW MODE OF ADMINISTERING THE BROMIDES.

In Paris the pharmacists have been astonished by the increasing number of prescriptions wherein the bromides are combined with naphthol and bismuth. This is simply carrying out suggestions made by PROFESSOR FÉRÉ, that large doses of the bromides tended, in certain individuals, to beget unpleasant symptoms, chiefly for the reason that the gastro-intestinal tract of such persons was in a condition of sepsis that prevented the proper assimilation of the drugs. He recommended the administration of such intestinal antiseptics as naphthol and salicylate of bismuth as a means of removing drug intolerance from this and from other causes. The following formula is one method found by him to be advantageous, in the treatment of epileptics especially:

R.—Bromide of potassium	. . . . .	5iss.
β -naphthol	. . . . .	3j.
Salicylate of sodium	. . . . .	5ss.

Mix, and divide into three doses, one dose to be given three times daily.

It is maintained by Féré that this treatment is curative as well as preventive. He has found that the eczema and psoriasis which sometimes follow in the train of borax will also disappear if the intestinal tract is rendered aseptic.

PEROXIDE OF HYDROGEN IN DISEASES OF THE EYE.

The following is a summary of the conclusions of DR. S. S. GOLOVIN regarding the use of peroxide of hydrogen in ophthalmic practice:

In healthy eyes the peroxide causes only trifling smarting and transient congestion of the conjunctiva. In diseased eyes, especially when deep corneal ulcers are present, instillation of the peroxide may give rise to a more or less intense burning sensation, which, however, quickly disappears spontaneously.

A reliable preparation should always be employed. The peroxide solutions are somewhat unstable, but decomposition can easily be prevented by the addition of a small quantity of sulphuric ether, and by keeping the mixture in an opaque glass in a dark place. A 3 per cent. solution may be employed for lotions or irrigations; stronger solutions should be used in the form of eye-drops.

R.—Hydrogenii hyperoxydati (10 to 15 per cent.) . ʒiiss.
 Ætheris sulphurici gtt. j.
 (Keep in a bottle of dark glass.)

Sig.—A few drops to be instilled into the eye several times a day.

The best results are obtained in corneal affections. Simple ulcers of the membrane rapidly disappear without being complicated with purulent infiltrations. Suppurating ulcers speedily assume a cleaner and healthier appearance, infiltrations undergo absorption, the lesions healing without perforation of the cornea occurring. Even in severe cases the only traces remaining at the site of the ulcers are slight opacities corresponding to the deepest portion of the excavation. The peroxide is also invaluable in cases of hypopyon keratitis. Provided the instillations are made regularly and thoroughly, even cases in which otherwise operative interference would be necessary, yield to the remedy.

Of conjunctival affections, the peroxide is especially of service in cases of phlyctenular conjunctivitis, which is cured by it much more rapidly than by ordinary treatment. It is also useful in the early stages of acute gonorrhœal ophthalmia (in which the instillation should be repeated not less than four or five times daily, or even every two hours), though the effects scarcely go beyond sterilizing the discharge and preventing or controlling corneal lesions. In simple acute and chronic diffuse catarrhs of the conjunctiva, as well as in trachomatous or follicular conjunctivitis, the peroxide seems to be useless.

[Much of the peroxide sold in this country is acid in reaction, and would be unsuitable to be dropped into the eye unless neutralized, in which case it keeps less well than when its reaction is acid.—ED.]—*British Medical Journal*, 1891, No. 1599.

THE METHODICAL EMPLOYMENT OF SULPHONAL IN MENTAL DISEASES.

DR. FORSTER publishes his experience with fifty-six patients of the Königs-mutter Institution. He was much pleased with the result. The drug acted principally as a motor depressant. Noisy, obstreperous patients were quieted down; many who were given to soiling themselves, ceased to do so. This condition of restfulness was induced in excitement stages of acute and chronic insanity, periodical and chronic mania, senile dementia, progressive paralysis, idiocy, and epilepsy. Thirty grains were generally sufficient, but as much as sixty were sometimes given. The single dose was from seven and a half to fifteen grains. In periodical excitement, given continuously, it shortened and ameliorated the period of excitement. It was of special value in acute melancholia and insanity. Epileptic attacks were not so violent; a cure of the epilepsy was not achieved.

He observed two forms of disagreeable by-effects, called by him sulphonal-

ismus. The first was a motor and sensory depressive form, that appeared as parietic weakness, at first of the lower extremities, then of the tongue and upper extremities. The other form was a persistent somnolency, and a diminution of sensation, weakening, or extinction of the cutaneous sensibility. The first stage of this was not dangerous, but the second required careful observation. The symptoms disappeared quickly on reduction of the dose of sulphonal. The pulse was generally regular and powerful. Neither respiration nor the uro-genital system was injuriously affected. Disturbances of the digestive tract were, however, observed twice, with an exanthem. Tolerance of the drug was never observed, so that, unlike morphine, it can be discontinued at any time.—*Medical Press*, 1891, No. 2730.

OXYGEN AS A DISTINCT REMEDY FOR DISEASE, AND A LIFE-SAVING AGENT IN EXTREME CASES.

On this subject, DR. A. W. CATLIN contributes an article, and cites cases where oxygen has been used with advantage. Primarily, and for a long time exclusively, this agent has been recommended in lung difficulties—more especially to relieve the dyspnœa and cyanotic conditions following in the train of a pneumonia, where a large amount of lung-structure is involved: another way of stating the fact that its use was deferred until the disease was far advanced, the strength exhausted, and the recuperative powers in abeyance—in other words, a *dernier ressort*, as a palliative, but not as a curative.

Fortunately, however, for our patients, another view is now taken of this life-saving agent, and to-day we recognize the fact that if we can, with a limited lung-capacity in acute disease, pass more or less continuously the same quantum of oxygen into the blood that is normally required when no disease is present, we practically lift our patient to the plane of health, so far as functional activity is concerned, and give him a hundred-fold more strength to battle with than before.

Dr. Catlin desires to show that oxygen is the most sure and satisfactory stimulant we have; that by being exhibited through the lungs, and not by the stomach, its entrance into the circulation is much more certain and immediate; that its effect, felt primarily upon the heart, is almost as quickly seen at the nerve centres and in the digestive organs; that it is preëminently the remedy for profound shock, either from hemorrhage or nervous drain, where vitality is at too low an ebb to take up the intricate history of assimilation and repair.

To get the best results the remedy must be administered at first freely and continuously, especially in those cases of profound shock where the depleted centres of life must have this true stimulation offered unremittingly. The only indications for a suspension of its use is a condition at once recognized by the patient, viz., super-exhilaration and dizziness, and this limitation is rarely reached in these extreme cases where the inhalations are not as deep or prolonged as they are when the strength returns and the demand for the stimulant naturally begins to limit itself. In other words, the patient, once instructed in its use and conscious of its helpfulness, is the best guide in its administration, and can be safely allowed to breathe it *ad libitum*. The fear

is they will not get enough, not that they will get too much. This, of course, implies that the pure gas mixed with nitrogen, two parts of the former to one of the latter, is being used.

There are many conditions under which oxygen can be exhibited, always with relief, even if the nature of the case is necessarily fatal. It is no small thing to say that it relieves needless suffering.

The objection so often raised to it as a cumbersome remedy, not easily obtained on short notice, no longer holds, for depots are established all over our large cities.—*Medical Record*, 1891, No. 1086.

DIURETIN.

Von Schröder found that both caffeine and theobromine had a marked diuretic action, and that caffeine had also an undesirable influence upon the brain and vasomotor centres. The fact that theobromine acted only upon the kidneys induced CHR. GRAM (*Therapeutische Monatshefte*, 1890, No. 1) to make clinical trials of its diuretic action. It was, however, soon found to have disadvantages; since it is only slightly soluble, it sometimes caused vomiting. After many attempts, Gram succeeded in finding a compound of theobromine which had not these disadvantages; this was a combination of a sodium salt of theobromine with salicylate of sodium, to which was given the name diuretin. This substance is soluble in water. The dose is fifteen grains, and this amount may be given six times a day. The diuresis after two or three days is marked, and it continues for a time after the withdrawal of the drug. If albumin is present, its amount is unchanged by the drug.

It will act as a diuretic in some cases where digitalis, caffeine, and strophanthus have failed. It has no cumulative action; the system is not readily rendered unresponsive to its action. It may be given with cardiac tonics.

The conclusions of DR. GETSLER are that diuretin unquestionably increases the blood-pressure, as he has found no exception to this in all of the few cases included in his observations, and he feels bound to include the drug among the cardiac stimulants, as well as among diuretics.

In patients with valvular disease its action was most satisfactory; less so in affections of the heart's muscle. In the latter cases its action was that of a diuretic chiefly.

In acute nephritis its action was much greater than in chronic nephritis, as shown by the increase in the urine and the rapid disappearance of the œdema.

In one case of cirrhosis of the liver it caused no diuresis; in a healthy person it increased somewhat the twenty-four hours' urine.

It is probable that the salicylate of sodium also contributes to the diuretic action, and that this is not the result of the theobromine alone.—*Berliner klinische Wochenschrift*, 1891, Nos. 16 and 17.

DR. AUG. HOFFMANN has found diuretin an energetic diuretic, especially in cardiac dropsy; it reaches its maximum effect on the second to the sixth day. As regards its action upon the heart he is not in accord with Schröder or Gram, since he finds the heart's action is made more regular and stronger

by it; as a substitute for digitalis it will not answer, though it may well be given with it.

As a substitute for caffeïne, as a diuretic, it will be found serviceable.

It is best given in solution, since it will not keep in the form of powder when exposed to the air for some time.

The carbonic acid of the air decomposes diuretin into insoluble theobromine. Fifteen grains in a tablespoonful of water, or—

R.—Diuretin	5jss.
Aq. menthæ pip.	5ij.
Syr. simpl.	5j.

Sig.—One tablespoonful five or six times a day.

All acid solutions and fruit syrups are to be avoided in prescriptions containing diuretin. In all cases it is best to have the solutions freshly made, as they decompose after a few days.—*Therapeutische Monatshefte*, 1891, No. 5.

DEATH AFTER SALOL.

Salol is usually considered a tolerably innocuous drug, but there are not wanting clinical observations which tend to show that, under certain circumstances at least, its use may be followed by dire results. Thus a case was some time ago reported by Aufrecht and Behm, in which death followed its use in acute endocarditis, and more recently DR. CHLAPOWSKI has published in a Bohemian medical journal an account of a case in which a similar fatal result followed a fifteen-grain dose ordered to a patient who was suffering from severe gastric symptoms, and who was being examined by Ewald's method. After taking the salol the patient became restless and unconscious, the pupils dilated, the pulse became irregular, there was constant vomiting, and the urine became dark and contained salicylic acid. Death occurred twelve days later. At the autopsy there were found gastritis and hemorrhagic enteritis, a gastric ulcer cicatrized at the cardiac end, chronic endometritis, and a cyst of the ovary. No doubt was entertained that the salol had caused the symptoms of poisoning.—*Lancet*, May 23, 1891.

[In such cases the early use of the soluble phosphates, such as Glauber's salt, should not be omitted.—ED.]

HYPODERMIC INJECTIONS OF CARBOLIC ACID IN ACUTE ARTICULAR RHEUMATISM.

In 1875 Senator published a paper in which he pointed out that marked alleviation of the local and some amelioration of the general symptoms quickly followed the hypodermic injection of a strong solution of carbolic acid into the neighborhood of the affected joints. This was accomplished without any appreciable ill effects to the patient.

DR. A. L. GILLESPIE has tried this treatment in about twenty-four cases, and publishes notes of five of them.

He injected from four to ten minims of a 10 (?) per cent. solution of carbolic acid. [As carbolic acid is not sufficiently soluble in water to make a

10 per cent. solution, some other solvent must have been added to the water.—Ed.]

A grain of the pure acid may be given at a dose.

In some cases the relief is speedily afforded, and the patients often begged for a repetition of the injection when another joint became painful.

It is said to be of special value in cases of gonorrhœal rheumatism in which no relief has followed the use of salicylates, but does not seem to act so well when many of the joints are affected.

It is best to pass the point of the hypodermic needle through the skin obliquely, and judging where the synovial membrane is, to inject the fluid as close outside the sac as possible.

Injected into the sac itself a 10 per cent. solution of carbolic acid precipitates the albumin present in the serous contents.

The *rationale* of the rapid disappearance of all the symptoms is, first, that it is due to the powerful local anæsthetic action of the acid; secondly, to some slight specific action against the rheumatic poison exerted by it.—*Medical Press*, 1891, No. 2719.

MEDICINE.

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FOR CHILDREN;

AND

SOLOMON SOLIS-COHEN, A.M., M.D.,

PROFESSOR OF CLINICAL MEDICINE AND APPLIED THERAPEUTICS IN THE PHILADELPHIA POLYCLINIC;
PHYSICIAN TO THE PHILADELPHIA HOSPITAL.

MALARIA ON THE GOLD COAST.

DR. W. T. PROUT, in *The Practitioner*, No. 291, 1891, states that the varieties of malaria met with on the Gold Coast of Africa are the same as elsewhere, but there is a tendency toward irregularity and severity in type, especially among Europeans. Well-marked quotidian, tertian, and quartan ague is rare, and met with among natives or in Europeans who have been long resident on the Coast, in whom the type approximates more closely to that observed in the native. In such cases the attack is essentially mild, of sudden onset, with shivering or chilliness, rapid rise of temperature to 104° or 105°, with headache, lumbar pain, etc., followed by a copious sweat and return to health on the next day. In natives, constipation and hepatic torpor are frequently associated, and the attack can be cured by a dose of blue pill. In newly arrived Europeans the attack is usually more severe, and comes under the head of bilious remittent. The cold stage is usually not observed, nausea is invariably present, and frequently vomiting forms a dangerous symptom.

Besides splenic enlargement and tenderness, there is tenderness over the pyloric end of the stomach, and at times along the hepatic margin of the ribs. The stools are dark bottle-green in color and offensive. The attack lasts four to six days, leaving the patient in a very exhausted and anæmic state, from which he slowly recovers.

The third type is the hæmoglobinuric form, which is fortunately the rarest, as it is the most severe and the most dangerous (*Lancet*, 1891, No. 3544). It rarely occurs in Europeans who are in robust health, but in those who have become debilitated and anæmic from repeated attacks of fever, or from mental worry or alcoholic or other excess. Dr. Prout inclined to associate it more particularly with any cause which interferes with the action of the liver, as he has seen it occur several times in beer-drinkers. The onset is sudden, accompanied, it may be, with slight shivering. Vomiting commences early, and is a prominent and intractable symptom throughout. At first it consists of bile, and latterly merely of the liquids imbibed, mixed with dark-green, shreddy particles. The tongue and breath are foul, and there is great thirst. The skin, conjunctivæ, and buccal mucous membranes are of a bright canary-yellow color. The temperature need not necessarily rise very high, and may even fall to normal, though the other symptoms persist. If after this there is a constantly rising temperature without remissions, the prognosis is unfavorable. The state of the urine early attracts the patient's attention. In the worst cases it is of a dark porter-like color, is almost syrupy in consistence, froths easily, and stains the sides of the vessel containing it a bright crimson. At this stage boiling and nitric acid show the presence of considerable quantity of albumin. A copious deposit forms on standing, which is seen to consist of pigment granules and pigment casts from the kidneys. A few blood-cells may be present, but they are not common. The quantity of urine is generally diminished. Recovery may take place, and in this case the general symptoms improve, the urine gradually becomes less high colored, increases in quantity, and becomes loaded with urates. Convalescence is naturally slow, and departure from the Coast is indicated. On the other hand, the symptoms may become aggravated; the urine diminishes in quantity, although the color generally improves, and total suppression may take place. Death in these cases results in from three to five days from uræmia and exhaustion.

The blood was examined in ten cases, partly native, partly European. They include two cases of bilious remittent, one of hæmoglobinuria, the rest being of the mild remittent type.

In eight cases distinct changes were observed in the red corpuscles. These were of five kinds:

1. Brightly refracting, rod-like bodies occurred in three cases, and in one of them were very numerous. They varied considerably in number and size, and appeared to possess a certain power of movement, which was possessed also by the other intra-corpuscular forms, which was rather pulsatile than an amœboid movement, although occasionally a slow alteration of their position in the corpuscle took place.

2. Brightly refracting round spots of various sizes, sometimes combined with the rods in the same corpuscle.

3. Large circular bodies, like vacuoles, lying in the centre or at the side of the corpuscle. Rods may also be seen along with these.

4. Irregular bodies, which may be regarded as transition stages between the above forms.

5. In three cases there were peculiar bodies, which were more like a tadpole or spermatozoön than anything else—possessing, as they did, an oval head with a tapering filament attached to it.

All these forms were characterized by an absence of pigment, which does not agree with other observations. It is possible, however, that the examination of a larger number of cases may result in the discovery of intra-corpuseular pigmented bodies, such as Osler describes.

Pigmented bodies were noticed in five cases:

1. Small corpuscles, about the size of a leucocyte, containing dark-brown pigment granules, distributed evenly throughout the cell.

2. Bodies two or three times the size of a leucocyte, containing similar granules of pigment, but arranged around clear spaces.

3. Pigmented bodies, showing amœboid movement.

4. Amœboid bodies containing large masses of black pigment. These bodies differ from those just described in the character of the pigment, which is in masses instead of fine granules; they are probably the phagocytes on whose scavenging properties Carter lays so much stress. It is possible, however, that all these forms are merely different stages of the same body. The pigmented crescents or spheres described by Laveran were not met with.

With reference to the time of occurrence of these bodies, it may be observed generally that the intra-corpuseular forms were present before the paroxysm and while the temperature was rising, and usually disappeared under treatment; while the pigmented bodies were found at all stages, but persisted for a considerable time after the attack had ceased. In one case the whole of the bodies were found; in one rods, clear spots, and pigmented bodies; in one rods, vacuoles, and pigmented bodies; in two vacuoles and tadpole bodies; in three vacuoles only; and in two pigmented bodies only. The effect of quinine in the cases in which examinations were made appeared to be the disappearance of the intra-corpuseular bodies. These observations, then, are of value as corroborating, to some extent at least, the results obtained elsewhere.

As regards the efficacy of quinine in the treatment of malaria, the author considers it the only drug which can be relied upon. Considerable stress is also laid on the influence of the state of the liver on the action of quinine. Thus: "It has been pointed out that quinine forms a salt with the bile which is sparingly soluble, and in practice it is frequently found that it is useless to administer quinine, and, in fact, that it has a distinctly prejudicial action, until the liver has been acted upon by a large dose of calomel or blue pill, which may even have to be repeated before satisfactory results are obtained. I have before me the records of several cases where a cholagogue had to be administered twice or thrice before there was any improvement in the condition. We must remember that we have to deal not only with the malarial organism, but with the results of blood-destruction which themselves are sufficient to cause a rise of temperature, as seen in cases of paroxysmal hæmoglobinuria at home, and in the febrile attacks of pernicious anæmia. The liver, which appears to be the main element in the removal of these morbid products, eventually becomes loaded with them,

which is seen on examination in the altered condition of the liver-cells. These are found to be filled with a fine yellow pigment, which is quite different from the melanæmic pigment, and which has quite different micro-chemical reactions, blacking with ammonium sulphides, and giving the Prussian-blue reaction on the addition of potassium ferrocyanide and dilute hydrochloric acid. It is evident, therefore, that until we assist the liver in getting rid of these morbid products other treatment will have little effect. Quinine can only be regarded as a poison to the malarial organism, killing it and preventing its further development. There are, no doubt, certain cases in which quinine entirely fails; but they are rare, and I believe are not pure cases of malarial fever, but probably associated with some obscure complication often connected with the state of the intestines."

Quinine in small doses taken over prolonged periods is recommended as a prophylactic. The treatment of the cachectic condition found in tropical climates is another matter. The condition more nearly approaches that of pernicious anæmia, and the most useful drug is arsenic in large doses, or, better than any medicine, removal to a cooler climate. Antipyrine and sulphonal have also been found useful adjuncts.

AN EPIDEMIC OF GASTRO-INTESTINAL CATARRH.

DR. G. M. LOWE, of Lincoln, refers to an epidemic of this complaint which occurred at the conclusion of the severe frost experienced last winter. According to observations in his own practice the affection occurred only among adults, the symptoms being epigastric pain, vomiting, frequent copious feculent discharges of a successively whitish-green and yellow color; sometimes considerable tenesmus, a dull yellowish color of conjunctivæ; the tongue furred, moist, and viscid; temperature seldom above 102°; anorexia, and great nervous prostration. In no instance any mucous, bloody, or typhoid stools. Complications were: jaundice in 3 cases, severe labial herpes in 7 cases, and bronchitis in 2 elderly persons, who both died; 132 recovered.

Two possible causes are discussed, viz., rapid and great alterations of temperature and pollution of drinking-water, the writer inclining, on the whole, to the former view.

[At the same time cases of an altogether similar type were very prevalent in London.—ED.]

INFLUENCE OF CARBOHYDRATES UPON PROTEID METABOLISM.

To determine if the loss of flesh which occurs in cases of diabetes is due to a failure of carbohydrate-metabolism, GRAHAM LUSK, Ph.B. (*Zeitschr. f. Biologie*, Bd. xxvii. p. 459), has endeavored to ascertain if a person in normal health, from the diet of whom the carbohydrates were withdrawn, would present the increase in proteid and fatty metabolism that takes place in diabetic patients. With this end in view, he partook, for three days, of a known amount of albuminoids, fats and carbohydrates; and, for another three days, of the same quantity of albuminoids and fat as in the first experiment, but omitting the carbohydrates; in each instance determining the amount of nitrogen excreted in the urine and feces. As a result, he found that, under the latter conditions, the amount of nitrogen eliminated was 36 per cent.

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CANTHARIDIN.

Conceiving that the transudation of serum from a healthy capillary caused by cantharidin would be greater from a vessel in an abnormal condition, LIEBREICH (*Deutsche med. Wochenschr.*, March 5, 1891) endeavored to determine the dose which would cause from capillaries of lowered resistance the same degree of exudation as occurs from normal vessels after larger doses. The results he reported at a meeting of the Berlin Medical Society. If the hypothesis is correct, some influence would be exerted upon pathological processes resulting from local irritation of bacillary or other nature. One-fiftieth of a milligramme of potassium cantharidate was injected into the back of a patient with a tumor of the œsophagus. Expectoration became easy and was increased as the dose was increased. It was determined that 0.0006 was the most that could be given without causing local phenomena, while there was strangury and the urine contained blood. The most suitable dose was 0.0001 or 0.0002. In cases of laryngeal tuberculosis, marked improvement in the voice was perceptible after the second injection. The patients may continue their occupations. The injections are made on alternate days. The bladder and the rectum must be looked after. Diarrhœa or burning micturition indicate a withdrawal of the injections. The remedy is prepared by dissolving 0.2 gramme of pure cantharidin and 0.4 gramme of potassie hydrate in 20 c.c.m. of water, and heating in a water-bath until a clear solution results. If sufficient water is added to make a litre, every cubic centimeter contains 0.0002.

HEYMAN reported that he had observed striking improvement in the voice and in the general condition in severe cases of laryngeal tuberculosis, usually after the third or fourth injection, given daily. No influence upon the number and appearance of the bacilli was observed. In three cases the râles had diminished or disappeared. In one case the area of dulness had diminished, expectoration became easier and less frequent, the sputum thinner, and the cough moderated in frequency and intensity—in four cases it almost entirely disappeared. Night-sweats occurred less frequently or ceased. Redness and infiltration of the larynx diminished. The granulations became pale and flat; the ulcers cleared up and became smaller from the periphery. A number of well-defined ulcers had healed; others were in process of cicatrization. In some of the worst cases acute exacerbations occurred. Rapid improvement was also observed in a number of cases of catarrhal affections.

B. FRÄNKEL has treated fifteen cases, mostly severe. He found the injection painful, though submitted to by the patient, the pain disappearing in a day or two. The usual symptoms following the internal administration of cantharidin were observed—strangury and tenesmus. The general condition improved, the voice returned, infiltration receded, and ulcers cleared up and healed.

A METHOD OF ACCELERATING DESQUAMATION AND THEREFORE OF SHORTENING THE INFECTIVE PERIOD IN SCARLATINA.

DR. W. ALLAN JAMIESON, of Edinburgh, advocates the use of resorcin on account of its well-known action of causing the outer layers of the epidermis to separate without injury to the deeper ones. A 3 per cent. resorcin-sali-

greater than under the former. Repeating the experiments, using in both, however, less than half the amount of nitrogen used in the first series, he found that the amount of nitrogen eliminated was greater than that ingested, the amount eliminated being increased 32 per cent. when carbohydrates were withheld. The inference is that the omission of carbohydrates from the food brings about a marked increase in proteid metabolism, and, conversely, that the destruction of carbohydrates tends to protect a certain amount of albuminoid matter. The excessive elimination of nitrogen, shown to take place in cases of diabetes, may be explained by the excretion of sugar in the urine, and it is highly probable that the failure of sugar-decomposition in the system is the cause of the loss of flesh. That the amounts of oxygen consumed and carbonic acid given off by diabetics and healthy persons, under conditions otherwise similar, are respectively alike, is indicated by the fact that the number of heat units produced to the cubic metre of body surface is the same in both. The oxygen used in health to burn sugar is in the case of diabetes used in the destruction of fat, of which destruction there is said to be a relative increase.

POTASSIUM CANTHARIDATE IN LUPUS.

SAALFELD (*Deutsche med. Wochenschr.*, March 12, 1891) presented a case of lupus, in which, after five injections of potassium cantharidate, the masses were reduced in size and paler than before.

LANDGRAF did not find the course of acute affections of the larynx shortened by the use of the remedy. From the results of its application in five cases of chronic disease, he concluded that its use, even in small doses, gave rise to an inflammatory œdema of the laryngeal mucous membrane, which disappeared rapidly.

LUBLINSKI had treated sixteen cases of pulmonary and laryngeal tuberculosis of moderate severity, with a varying number of injections. The application of the remedy is painful in most cases, and more painful from the use of the potassium than of the sodium salt. In two cases, strangury occurred after the second injection; in one, after the third. Neither albumin nor blood was found in the urine. In one case the sputum became blood-streaked for the first time after the third injection; in another after the fourth. Some patients felt a sense of warmth in the throat. The majority stated that the cough was looser and the expectoration freer. After the second, third, or fourth injection, the seat of the disease in the larynx appeared hyperæmic and covered with thin secretion. In one case there was dysphagia. The infiltration, especially of the inter-arytenoid fold, receded in most cases, and the voice improved. In one case, an inter-arytenoid ulcer, and in another, after seven injections, ulceration of the right vocal band healed; in a third case, after two injections, an ulcer at the free margin of the left band became progressively smaller; in a fourth, an arytenoid ulcer had almost entirely disappeared, after four injections had been made. In a case presenting, in addition to pulmonary and laryngeal tuberculosis, lupus of the dorsum of one hand, it was stated that the pains of the latter had disappeared after the fourth injection.

the white substance. One cyst was apparently about $\frac{1}{2}$ inch in depth. There was no sclerosis or induration in the neighborhood of the cysts. A third section, made lower than the above and on a level with the upper surface of the cerebellum, and slicing the optic thalamus, caudate nucleus, and internal capsule, showed the lower limit of the cyst just described, a second old blood-cyst, and another small one. Another similar cyst was found in the white substance of the frontal region at a lower level.

Sections of the cord made in the cervical, dorsal, and lumbar regions did not show any sclerosis or wasting of the descending tracts, neither was there any wasting of the internal capsule or crura.

In reviewing the history of the case in the light of the morbid anatomy, there seems to be little room for doubt that the initial convulsions were the cause and not the consequence of the multiple hemorrhages. It is hardly conceivable that these should be caused by any thrombosis, embolism, or arteritis; they must presumably have been due to a sudden engorgement of the veins due to asphyxia, in consequence of spasm of the respiratory muscles.

Cases of this kind are by no means uncommon, and the view put forward in this communication has been expressed by several recent writers, among others by Goodhart, Osler, and Angell Money.—*Practitioner*, 1891, No. 276.

THE INFLUENCE OF DISEASES UPON THE RESPIRATORY INTERCHANGE OF GASES.

To determine if disturbances involving the exchange of gases between the air and the blood, and if anomalies of tissue metamorphosis in conjunction with which the need of oxygen or the capability of the tissues to unite with oxygen may be altered, do in reality materially influence the respiratory interchange of gases, KRAUS and CHVOSTEK (*Wiener klin. Wochenschr.*, Bd. iv. 1891, p. 33) made forty observations in twelve persons with various forms of anæmia (pernicious and secondary anæmia and chlorosis), leukæmia, and the carcinomatous cachexia. Under ordinary conditions no aberration from the normal was observed in the gaseous interchange. The taking of nourishment invariably augmented the interchange, as happens also in healthy persons during digestion. In a small number of cases muscular activity increased the combustion of oxygen and the production of carbonic acid, but not in the same degree as in health; in the anæmic patients, the respiratory coefficient (which normally arises) was lowered.

To determine the activity of the bodily oxidation, benzole was administered to six patients with diabetes, anæmia, carcinoma of the stomach, and leukæmia, and the quantity of phenol excreted was measured. The proportion of phenol was found small in conditions of impaired nutrition, but no special change was observed for any single affection.

In investigating the influence exerted upon the respiratory process by an increased volume of oxygen in the inspired air, an admixture of ten volumes of nitrogen and ninety volumes of oxygen was used. The subjective condition of healthy and ill persons was not materially influenced by the continuous breathing of such a mixture; nor did objective manifestations appear. During the first ten minutes of easy breathing a considerable increase in the comparative quantity of oxygen absorbed was noted; subsequently the absorp-

cylic-superfatted soap was employed, and when used, with warm water, from the commencement to the close of desquamation a notable diminution in the period of "peeling" was observed.

From the consideration of a large number of unselected cases the conclusion has been arrived at that, while the commencement of desquamation may be as early as the fourth day of the disease, or may, in exceptional instances, be delayed as late even as the sixteenth, the average day on which it is first visible is the ninth. Again, from the onset of the disease till the completion of desquamation in sixty-two unselected cases the average was 55.5 days, no treatment having been employed to interfere with the natural process. But when washing with the resorcin-salicylic soap was begun as soon as signs of desquamation could be noticed, or shortly before, the desquamation was entirely completed in 40.26 days. There is thus a gain, on the average, of more than a fortnight. In two cases washing with the soap was practised on only one side of the body, a commencement being made in one three, in the other four, days prior to the appearance of any trace of scaling. In the case in which the right side was washed, peeling began on the right palm, and then subsequently on the right side of the trunk and limbs; in that in which the left side was so treated, the left palm, then the left side of the trunk and limbs, showed the earliest indications of desquamation. In all cases it was found advantageous, after washing with the soap and drying the body, to smear on a small quantity of some bland oil, such as olive, almond, or purified whale oil. The nurses, too, found it necessary to protect their hands with India-rubber gloves, or to use a sponge carefully in washing the patients, else their palms became tender from a thinning of the epidermis. Such of the patients, also, who were old enough or far enough advanced in convalescence to wash themselves, noticed that the hand used in washing desquamated earlier than the other.—*Lancet*, 1891, No. 3550.

CONVULSIONS AS A CAUSE OF CEREBRAL HEMORRHAGE IN EARLY LIFE.

DR. HENRY ASHBY, of Manchester, reports a case which, in his opinion, strongly supports the view that a series of convulsions may give rise to a multiple hemorrhage.

A boy, aged twelve years, was admitted to hospital suffering from tuberculosis and old hemiplegia. He was well and strong until two years old, and free from hereditary taint. At this time he had a fit, followed by unconsciousness for ten minutes, attributed to eating pie-crust. Two weeks later he had another more severe fit, lasting half an hour, affecting especially the right arm and leg. After this the right arm hung useless, and he dragged the right leg in walking. Both limbs have recovered to some extent, but have remained more or less stiff and rigid. From this time until ten years of age he had two fits a week on an average. There was no evidence of mental weakness. He died of tuberculosis in February, 1891. The brain was examined on the following day. The outer surface was normal everywhere.

A section made exposing the lateral ventricles, without slicing the corpus striatum, showed an old cyst with brownish contents, $\frac{5}{8}$ inch in length, situated on the left side in the white substance between the fissure of Rolando and the corpus striatum; and four small cysts, situated on the right side in

mucons membrane, and is carried up the bowel, so that the pile is left connected by vessels and mucons membrane only. A strong silk ligature is then tied as tightly as possible, and the ligatured pile is returned within the sphincter.

This method is very well suited to piles which are large and vascular and are inclined to be sessile rather than pedunculated. It should be applied to patients who have any tendency to cardiac or kidney disease, or where there is a thrombosed condition of the vessels. It is the best to use when patients are feeble. Ligature is, in fact, the safest operation. Its drawbacks are that the wound takes some time to heal, there is more pain after operation and on the first motion of the bowels, than after crushing or simple excision. There is more sloughing and suppuration until the ligatures have separated, and hence there is greater liability to some contraction.

The crushing operation consists in drawing the pile by means of a hook into a powerful screw-crusher, which is tightly screwed up, and distal end of pile cut off. The crusher should be applied on the longitudinal aspect of the bowel and should be left on the pile for about two minutes. This operation should be used when the piles are medium-sized and rather pedunculated, and the patients are in good health; but in bad cases it is not so safe as the ligature. In ordinary cases its advantages are that there is freedom from pain after operation; retention of urine is of rare occurrence; suppuration is not likely; there is little or no pain on the first action of the bowels, and recovery is usually rapid; after-contraction is not common. The clamp and cautery are not favored by Allingham. He states that statistics show that it is quite six times as fatal as ligature or crushing; and burning gives more pain after operation, as is the case with all burns. Hemorrhage is more likely to occur, there is greater sloughing of the rectal tissue. More time is required for healing and greater contraction is common, as is also the case with all burns. The excision of piles is best applied to one prolapsed pile, to the single perineal pile, so common in women, or to one pile which is complicated with fistula, ulcer, fissure, etc. As a rule, one or two vessels require clipping. It is, therefore, inexpedient to excise many piles, for there may be trouble in picking up the divided arteries.

Allingham believes that Whitehead's excision method—that is, removal of the entire pile area and stitching of the healthy bowel above to the sphincter—is rarely necessary. It is a slow and bloody operation, and is at times followed by contraction. Few cases are really well under three weeks after operation, and premature resumption of the ordinary ways of life may cause a greater tendency to contraction, or, what is worse, troublesome and tedious ulceration may supervene and take months to heal.

FIXATION IN THE TRACTION TREATMENT OF HIP DISEASE.

Attention is called by LOVETT (*New York Medical Journal*, vol. liv., No. 6) to the important place which fixation should occupy in the traction treatment of hip-joint disease. The ordinary traction splint now commonly used is a device which gives passive motion without friction. Fixation was not considered one of its attributes. The author has many times shown that this splint allows of very wide motion in mild cases of hip disease. Where joint

tion of oxygen fell to the normal or lower. That this primary increase took place in anæmic patients with a decided deficiency of hæmoglobin makes it evident that the excess of oxygen taken up combines with the tissues. For a short time at the beginning of the experiment the exhalation of carbonic acid was increased, though not in the same degree as the absorption of oxygen. These observations indicate that there is no more substantial basis for the employment of oxygen in disease than has hitherto existed. Clinically, inhalations of oxygen were inefficacious. The most important indication for such a measure would be the sudden occurrence of respiratory insufficiency.

SURGERY.

UNDER THE CHARGE OF

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SURGICAL TREATMENT OF PILES.

On the basis of 200 cases of operation on hemorrhoids, ALLINGHAM (*Medical Press and Circular*, 1891, No. 2724) discusses the surgical treatment of this disease.

He divides hemorrhoids into two groups: the first including those which come down at stool, and those which are almost always in a state of prolapse and bleed profusely at each act of the bowel. In this class of cases the quickest operation is the best, since as a result of long-continued hemorrhage there is always considerable anæmia, and therefore it is of prime importance that as little blood as possible should be lost from the operation, and that there should be a minimum of risk of secondary hemorrhage. These requirements are fulfilled by the ligature, which can be applied in a very few minutes and is practically free from any danger of after-hemorrhage.

The second group comprises those piles which are chiefly troublesome because of the inconvenience they occasion, since they are prone to come down and prevent the patient taking any active exercise. These piles rarely bleed and do not otherwise interfere with the enjoyment of good health. Here the great point is to select the least painful operation. The best modes are crushing or simply cutting off the piles and picking up any vessels that may bleed.

In the operation of ligation with incision the pile is drawn down by a vulsellum and separated from the muscular and submucous tissues upon which it rests. The incision is made upon the skin at the junction of the

CONTRIBUTION TO THE KNOWLEDGE OF SARCOMA.

COLEY (*Annals of Surgery*, vol. xiv., No. 3) reports a case of round-celled sarcoma of the metacarpal bone, which he treated by amputation of the forearm about four months after the observation of the first tumor. In a little more than a month there was general dissemination of the disease, and death followed six weeks after the operation.

Coley has made a careful analysis of 90 unpublished cases of sarcoma, embracing nearly all those treated in the New York hospitals for the last fifteen years. He succeeded in obtaining the subsequent histories of 44. Of these 9 were living at periods ranging from three to ten years after operation, and 4 were living free from recurrence twelve to eighteen months after operation.

The chief characteristics of subperiosteal sarcoma are: there is usually a history of traumatism; the pain precedes the tumor and remains throughout the disease; the tumor is usually fusiform and seldom encapsulated, there being rapid infiltration of the surrounding tissue; it increases rapidly in size; the skin is discolored in the later stages; there is a slight elevation of temperature and an abnormally rapid pulse, and that there is very little tendency to ulceration.

After citing Brune's famous paper upon the curative influence of erysipelas upon sarcoma and carcinoma, Coley reports 3 cases of sarcoma in which inoculations of pure cultures of erysipelas streptococcus were employed. These inoculations were made repeatedly and were followed by local reaction; the tumor seemed to be distinctly lessened in size. No cures are mentioned. To the 5 cases collected by Brune, Coley has added 6 others in addition to the 3 he inoculated: 6 were cured and 2 were greatly improved.

CRANIECTOMY FOR MICROCEPHALUS.

VICTOR HORSLEY (*Internat. klin. Rund.*, v. Jahrg., No. 38), after a careful review of the subject of craniectomy for microcephalus, and after a report of 2 cases, concludes that operative treatment in cases of microcephalus and synostosis is fully justifiable, since the condition is in itself absolutely hopeless, and since surgical intervention has been followed by decided improvement. There are, of course, in these cases special dangers, but these may be limited by restricting the operation both in time and extent.

THE RESULTS OF RADICAL OPERATION FOR NON-STRANGULATED HERNIA.

LUCAS CHAMPIONNIÈRE (*L'Abeille Médicale*, 48 an., No. 43) states that he has performed 254 operations for the radical cure of non-strangulated hernia, beginning this series of cases ten years ago. Of this number but two perished—one because he was in very bad condition, the other because of internal strangulation. In spite of this excellent result, in so far as life is concerned, the operation is found useless and fatal unless it is undertaken under certain definite conditions and carried out under a well-considered system.

The results of operation have been excellent. The greater number of patients have not been compelled to wear trusses or supports; or, in less favorable cases, this has been found necessary for not longer than two months.

motion is not painful in a fairly wide arc, motion within the limits of that arc is not wholly harmful. In cases where the disease is severe, and where the patient is constantly and harmfully active, the ordinary traction splint is not followed by good results. With the idea of combining traction and fixation, Lovett has devised a splint which should be bent to fit the curve of the back; practically it is a combination of the Taylor and Thomas splints, and has the hip-band of the Taylor splint with two perineal bands, and the leg-piece is in a measure like the Thomas splint, excepting that it is prolonged beyond the foot to end in a traction apparatus. The splint does not attempt to force the leg into position by using the lever principle; it simply aims to make a traction, and while doing this it fixes the hip as much as can be done by any portable appliance. By means of the pelvic band this splint firmly holds the leg, pelvis, and thorax.

The author uses this appliance where sensitiveness of the hip is present to any extent, where the temperature is high, or where there is much induration of the soft parts—in short, in all bad cases. In addition, he applies it to unruly children, and to those whose parents are ignorant or shiftless.

Fixation in bed is desirable when sensitiveness occurs in the joint or malposition in the limb begins to appear. Statistical study seems to show that fixation in bed, when malformation occurs, not only is an important means of cure of this malposition, but serves to prevent the occurrence of abscesses in a very large proportion of cases.

LAPAROTOMY FOR WOUNDS OF THE LIVER.

BROCA (*Le Mercredi Medical*, 1891, No. 29) reports two cases of wound of the liver, each treated by surgical intervention, and each terminating fatally. The first patient was seen six hours after the infliction of the stab wound. He exhibited the symptoms of large hemorrhage. The wound was enlarged; the source of bleeding was found to be the liver; blood was flowing freely from the incision upon the anterior surface of this organ. An attempt to suture this wound proved futile, the threads tearing through. Thermo-cautery also failed to check the bleeding; an iodoform tampon was, however, entirely successful. An hour was consumed in the operation.

The patient perished two days later of abdominal septicæmia.

At the autopsy several other wounds were found, in some of which there had been bleeding after operation.

The second case was also a stab wound. The patient was seen four hours after the injury, and presented all the symptoms of intra-peritoneal hemorrhage. The abdomen was opened and a non-penetrating and penetrating wound of the stomach were found. A wound three inches long was observed on the lower surface of the liver. By means of a silk suture this wound was closed and the bleeding ceased. The patient died in a few hours with symptoms of continued hemorrhage.

At the autopsy it was found that the knife had passed completely through the liver, the wound of exit being located on the upper surface of this organ one-fifth of an inch behind the suspensory ligament. From this source sufficient blood flowed to entirely fill the pelvis.

nerve was resected, the piece removed measuring four or five millimetres in length, and the parts bathed with a sublimate solution 1 : 2000. The operation was followed by protrusion of the globe, which lasted but three or four days ; at the end of ten days the eyes were in very satisfactory condition, the sound one relieved of its attacks of lachrymation, and on the twentieth day he was discharged and the case reported as a cure in the *Bulletin des Quinze-vingts* for 1890.

Within two months after his discharge the patient returned with redness of the better eye. He was put upon mercurial inunctions, which he used regularly for three weeks, when he returned with vision reduced to counting fingers at two metres, iris inflamed, and vitreous opacities. The exciting eye was then enucleated, and after four or five days the other began to improve. When the case was reported at the end of three weeks after the enucleation, vision had risen to one-half the normal.

TRANSPLANTATION OF THE CORNEA.

VON HIPPEL reports in the *Berliner Klin. Wochenschrift*, xxviii. Jahrg., No. 19, his seventh case subjected to this operation. The patient had a dark-brown opacity which covered the pupil, and which had been produced by repeated cauterizations of the cornea with nitrate of silver. He also had cataract. After extraction of the opaque lens, with iridectomy, he had vision equal one-fifth, but he insisted on the removal of the spot on the cornea. The corneal tissue, down to Descemet's membrane, was removed from a circle four millimetres in diameter, and replaced by the full thickness of the cornea from a young rabbit. The eye was afterward dressed with iodoform and both eyes bandaged. Although there was temporary clouding of the thin layer of original tissue behind it, the transplanted flap remained clear. In two weeks the epithelium was continuous from the cornea to the flap. After dissection for a secondary cataract, the patient obtained vision equal one-third. It does not appear from the report that the transplantation caused any improvement in vision. But the operation deserves to be called successful in that it secured the continued life and health of the graft, and removed an unsightly scar.

MERCURY IN SYPHILITIC DISEASE OF THE EYES.

GALEZOWSKI, in the *Recueil d'Ophthalmologie*, An. xiii., No. 3, points out that mercury administered by the digestive tract acts very rapidly on iritis, either plastic or gummatous, not that a radical cure is effected, but the ocular inflammation disappears. Not so with syphilitic choroiditis, which yields to no mercurial administered by the mouth, but is cured almost without exception by mercurial inunction.

It is still otherwise with the ataxic atrophies of the optic papilla, which are without doubt usually syphilitic. Here, unfortunately, any anti-syphilitic treatment gives unsatisfactory results. This Galezowski explains on the hypothesis that the action of such medicaments is slow in the case of certain affections occurring in closed cavities, as in choroiditis and affections of the spinal cord.

While iritis can be cured in two or three months, choroiditis requires two

The indications which have been fulfilled in the radical operation are: 1. As extensive an ablation of the peritoneum as possible. 2. Removal of as much omentum as can be reached, or can be drawn into the sac. 3. Formation of a strong and extensive cicatrix in the hernia region.

Of the 254 cases 222 were inguinal, 14 were crural, 17 were umbilical, 1 was traumatic. The most satisfactory results in the operations upon inguinal hernia were obtained in cases of the congenital form of this rupture.

The results of radical cure of umbilical hernia are said to be particularly satisfactory.

The author believes that the radical cure of reducible hernia should be the rule and not the exception. In very young infants, however, he does not counsel operation, not because such cases can be cured by other means, but because the tissues are not sufficiently firm to make a reliable cicatrix. After the sixth and seventh year, however, the operation is strongly advised. In old persons operation should be avoided unless there are pressing reasons for resorting to the knife. Finally, even those of the proper age—that is, between seven and forty, should not be operated upon when the abdominal walls are weak, or there is a tendency to giving way in several regions. Congenital inguinal hernia invariably should be operated upon. This admits of no exception. The same rule applies to all hernias in young women.

[Since the operator began this series of cases ten years ago, he might furnish valuable figures in regard to the ultimate effect of hernial operation. This, unfortunately, he neglects to do.—ED.]

OPHTHALMOLOGY.

UNDER THE CHARGE OF

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SYMPATHETIC OPHTHALMIA NOTWITHSTANDING RESECTION OF THE OPTIC NERVE.

DR. A. TROUSSEAU reports a case of this kind in the *Revue Générale d'Ophthalmologie*, Tome x., No. 3. The exciting eye had been wounded by the blow of a stone six years before, and after remaining quiet three and a half or four years became again troublesome, and he applied to have it removed. It was shrunken, red, the seat of violent cyclitis. The other eye, except for the excessive secretion of tears from time to time, was absolutely healthy, with full acuteness of vision.

On account of the slight deformity, and the previous long period during which it had remained entirely quiet, it was judged an especially appropriate case for resection of the nerve, rather than enucleation. Accordingly, the

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years; and in the case of optic atrophy the disease outruns the treatment, and produces permanent injury before the cure can be effected. Probably by a course of daily mercurial inunctions, carried out for two consecutive years on the occurrence of the earlier lesions of syphilis, optic atrophy, cerebral syphilis, and such later lesions could always be prevented.

HERPES OF THE CORNEA FROM INFLUENZA TREATED WITH PYOKTANIN.

GALEZOWSKI (*Recueil d'Ophthalmologie*, An. xiii., No. 4) regards this affection as essentially one of the fifth nerve. It has been met with very frequently during the last two years in Paris, more particularly during the epidemic of influenza. The form of eye disease most commonly connected with the influenza was a phlyctenular conjunctivitis, or a superficial herpetic keratitis, with loss of epithelium, anæsthesia of the cornea, and which did not yield to the ordinary treatment for that affection. The two measures found to hasten the cure were the internal administration of large doses of quinine and the applications of apyonine or pyoktanin. The solution of pyoktanin, one part to one hundred parts of distilled water, was brushed on the cornea five or six times a day, and produced excellent and rapid improvement.

THE LIGHT-STREAK ON THE RETINAL VESSELS.

VAN TRIGT put forth the hypothesis that this streak was due to reflection from the anterior wall of the vessel or the anterior surface of the blood-column in the vessel, and this explanation was adopted by Jäger, Donders, and others. Loring ascribed it to refraction of the light passing through the blood-column and reflection from the tissues behind the vessel, and using a watery solution of carmine in a glass tube, he showed that under the conditions that exist in examining a retinal vessel the light-streak was seen when the tube was placed in front of a reflecting surface, and not seen when placed in front of a non-reflecting surface. Donders, however, claimed that the blood of warm-blooded animals was not transparent like the carmine solution, and therefore the conditions were essentially different in Loring's experiment from those the experiment was intended to elucidate. DR. A. E. DAVIS (*Archives of Ophthalmology*, vol. xx., No. 1), repeating the experiment, but using the blood flowing from the carotid of a cat, obtained precisely the results reported by Loring with the carmine solution. This seems to prove conclusively that the light-streak does depend on the refraction of the blood-column and reflection by the tissues back of the vessel.

PLATINUM INSTRUMENTS IN OPHTHALMIC SURGERY.

DR. E. GRUENING urges (*Archives of Ophthalmology*, vol. xx., No. 2) the use of such instruments on account of the ease with which they are sterilized. He has had cystotome, iris repositor, wire loop, spoon, iris and fixation forceps, and speculum made with the working parts consisting of an alloy of platinum and iridium. This alloy by hammering becomes very firm, can be polished, and is not blackened in the flame of a spirit-lamp. By heating to a white heat, such an instrument can be certainly sterilized by the operator at the time of operation, without his having to depend on the skill and care of an assistant.

ANIRIDIA AND GLAUCOMA.

E. T. COLLINS, F.R.C.S., reports in the *Ophthalmic Review*, vol. x., No. 114, three cases in which these conditions coexisted. It might be that in such cases at least glaucoma could not be due to closure of the filtration angle of the anterior chamber, and that some other explanation would have to be found for its occurrence. But in two of these cases of congenital aniridia, although no iris was visible, the ciliary body was found at the microscopical examination to end anteriorly in a rounded nodule that had become applied and adherent to the filtration space of the cornea in such a way as to block it entirely. In the third case, although the iris had been entirely torn away by traumatism and the ciliary muscle was atrophied, the most anterior of the ciliary processes was intimately adherent to the region of the cornea in question. Exceptions of this kind may truly be said to prove the rule that glaucoma is due to blocking of the filtration area by the iris.

GUMMA OF THE CONJUNCTIVA.

Gumma of the conjunctiva is of rare occurrence, and partly on that account is very apt not to be recognized. DR. CAUDRON (*Revue générale d'Ophthalmologie*, Tome x., No. 4) reports a case, and quotes a few others previously reported. In his patient, a man of forty years, giving no history, it appeared external to the cornea, the tumor measuring about ten millimetres in the horizontal, four millimetres in the vertical direction, and three millimetres in thickness. Its color was reddish-yellow, and it was surrounded by an area of vascularization. Its consistence was firm, being almost cartilaginous at the periphery. Thorough examination revealed numerous other evidences of syphilis. Placed on anti-syphilitic treatment, improvement was rapid. A complete cure was effected in two months, and there had been no subsequent manifestations. A study of the reported cases shows that the cure of such lesions is usually rapid and easy under appropriate treatment.

OBSTETRICS.

UNDER THE CHARGE OF

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PROFESSOR OF OBSTETRICS AND DISEASES OF CHILDREN IN THE PHILADELPHIA POLYCLINIC;
CLINICAL LECTURER ON OBSTETRICS IN THE JEFFERSON MEDICAL COLLEGE;
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THE PATHOLOGY AND TREATMENT OF PUERPERAL ECLAMPSIA.

In connection with the interesting paper of HERMAN (page 485 of the present issue of THE JOURNAL) the recent literature of eclampsia offers much of interest.

In a discussion on the subject at the British Medical Association during

the summer, GALABIN inclined to the uræmic theory of the causation of eclampsia. He quoted the statistics of Guy's Hospital, which showed an improvement in the mortality following the substitution of chloroform for bleeding. Mortality at present was reduced to 20 per cent. Moderate venesection, to relieve extreme vascular congestion, he thought advisable in some cases; bleeding to stop convulsions is inadmissible. BYERS had found the chloroform and chloral treatment, with the speedy termination of labor, most advantageous. AUVARD, of Paris, regarded eclampsia as caused by toxæmia, from failure of the emunctories. Treatment consisted in causing prompt and free elimination, in narcotizing the nervous system until the uterus can be emptied. SWAYNE had seen 36 cases of eclampsia in private consultations. In 24 bleeding was used, in 1 thirty ounces of blood were taken. The convulsions ceased, although other agents had failed. GODSON induced labor when albumin was abundant and urea deficient in the urine.

In general, the opinion was adverse to bleeding, except where marked engorgement was present; labor is to be induced when albuminuria and deficient urea are present.

PATHOLOGY OF ECLAMPSIA AND ALBUMINURIA, WITH REPORT OF A CASE.

VAN SANTVOORD (*Medical Record*, vol. xl., No. 8, 1891) describes the case of a patient whom he observed during two pregnancies, who had albuminuria and diminished excretion of urea. Symptoms of toxæmia were present during both pregnancies, and one eclamptic seizure occurred two months before labor, without apparent reflex cause. The patient bore two healthy children and recovered. The theory of toxæmia from deficient liver action, attended by diminished formation of urea, seems most rational to Van Santvoord. In the treatment of his case, nitroglycerin, digitalis, and citrate of potassium were efficient.

THE TREATMENT OF ALBUMINURIA AND NEPHRITIS IN PREGNANCY.

MIJULIEFF (*Geneesk. Cour.*, 1891, No. 18) has derived the following indications for treatment from three cases of nephritis in pregnancy in which the foetus perished in the uterus: when a woman previously healthy shows symptoms of nephritis during the first months of pregnancy, abortion should be induced; in the second half of pregnancy it is rarely necessary to interrupt pregnancy, except for urgent symptoms. In chronic nephritis during pregnancy, labor should be induced in the interest of mother and child as soon as viability is possible.

THE TREATMENT OF ECLAMPSIA DURING PREGNANCY BY RAPID DELIVERY.

HAULTAIN (*Edinburgh Medical Journal*, 1891) treated four cases of eclampsia during pregnancy by $\frac{1}{2}$ grain pilocarpine subcutaneously, with the external application of heat; croton oil; and 30 grains of chloral, followed by 10 grains every hour for four hours; milk diet; 5 minims of tincture of digitalis thrice daily, and saline purges were also continued. Haultain performed delivery as soon as possible, in the following way: after the patient

has perspired freely and been purged and has taken 30 grains of chloral the previous evening, she is deeply chloroformed and the cervix is dilated by the fingers; the membranes are ruptured, and the child is delivered by forceps. From sixty-five to ninety minutes were required to dilate the cervix; the entire delivery consumed between two and three hours.

THE OPERATIVE TREATMENT OF ECLAMPSIA: CÆSAREAN OPERATION.

SWIECICKI (*Der Frauenarzt*, 1891, Heft 9) performed Cæsarean section on a patient comatose in eclampsia, in whom the os and cervix were undilated and the child lived. The child was asphyxiated at delivery, and could not be resuscitated. The mother perished of pulmonary œdema. This is the tenth Cæsarean operation for eclampsia, six having been done in Holland, one by Von Herff at Halle, one by Rosthorn, and one by Müller at Berne. The operation is only justifiable when the child lives and the genital canal is entirely undilated.

A SUCCESSFUL CÆSAREAN SECTION FOR ECLAMPSIA.

VON HERFF (*Berliner klin. Sammlung klin. Vorträge*, Heft 32) advises the induction of labor when the upper portion of the cervix is dilated, and only the vaginal portion remains closed. When no dilatation is present Cæsarean section is indicated. In a case of severe eclampsia he operated by Cæsarean section; mother and child survived.

A PARASITIC MONSTER.

NORRIS describes a parasitic monster, recently exhibited in Philadelphia, as follows:

The boy Laloo, a monster of the dipygus parasiticus variety, is nineteen years of age, and apparently enjoys good health. The parasite consists of the two upper extremities and a rudimentary pelvis with the two lower extremities closely joined together. It is attached to the boy firmly at the lower right side of the sternum near the ensiform cartilage by a bony pedicle surrounded by soft tissues and covered with integument, and hangs over the lower portion of the chest, the epigastrie and right hypochondriac regions, the anterior surface of the parasite looking toward the abdomen of the boy. The skin contains venous capillaries, and is sensitive to touch, the degree of sensibility decreasing as the hands and feet are approached. The hands and feet are contorted, the feet being better developed than the hands. The fingers of the left hand are diminutive and webbed, those of the right hand are more developed, the phalanges being distinct. The glutei are separate and distinct, having between them a natal fold, in which can be found a trace of an anal aperture. The legs are flexed upon the thighs. Careful examination failed to discover respiratory murmur or cardiac pulsations. Coils of intestines could be felt. Discharge of feces from the parasite does not occur, and urination takes place without the boy's knowledge until after the urine has been voided. Perspiration and elevation of the temperature occur simultaneously with these phenomena in the boy. The sex of the parasite is undetermined, it being most probably a pseudo-hermaphrodite.

To pander to the morbid propensities of the curious, the managers of the museum have shrewdly clad the parasite in female attire. The boy, whose intelligence is quite remarkable, states that the surgeons who had examined him had generally decided that the removal of the parasite by surgical means would be directly dangerous to his life.

GYNECOLOGY.

UNDER THE CHARGE OF
HENRY C. COE, M.D., M.R.C.S.,
OF NEW YORK.

THE EARLY DIAGNOSIS OF CANCER OF THE UTERUS.

WINTER (*Berliner klin. Wochenschrift*, 1891, No. 33) reviews the recent results of extirpation of the cancerous uterus in Germany, showing that the total mortality of the five principal operators is only 8.4 per cent., the lowest being Kaltenbach's (3.3 per cent.). Although a certain number of fatal cases is inevitable on account of the difficulty of absolutely eliminating sepsis, other dangers ought to be avoided by improved technique, so that the mortality can be reduced to 5 per cent. The statistics of high amputation are still better, the Berlin Klinik showing a mortality of 6.5 per cent. (in 155 cases) previous to 1884, since which time no deaths have followed the operation in 64 additional cases.

Unfortunately, the remote results of both operations have not been as favorable as could be desired. A local recurrence (in the cicatrix) can usually be expected within two years at the utmost, while recurrence in the lymph-glands and pelvic connective tissue occurs later. This difference has not been clearly defined in the statistics. According to the writer's observations, after high amputation 38 per cent. of the patients were well at the end of two years, and 26.5 per cent. had no recurrence five years after operation, after which time a return of the disease is exceptional. Fritsch has noted 36 per cent. of cures after vaginal hysterectomy at the end of five years, and Hofmeier 33 per cent. at the end of four.

Only a small proportion of the patients with cancer of the uterus are suitable cases for a radical operation (about 25 per cent.), and if one-fourth of these are cured, it follows that only 7 per cent. of the entire number of cancerous patients are cured. In other words, the diagnosis of malignant disease is not made at a sufficiently early stage, and this neglect is traceable to the general practitioner. "The physician to whom the patient first applies decides her fate in the majority of the cases." Hence it is extremely important that he should be familiar with the initial symptoms. Of these a watery vaginal discharge is the most constant, especially in carcinoma of the portio. Menorrhagia, in a patient whose flow has formerly been normal should

always awaken suspicion and lead to an examination. Hemorrhage after coitus is an initial symptom of great importance, and when occurring some time after the establishment of the menopause it is almost pathognomonic of malignant disease.

Pelvic pain is usually a late symptom, due to secondary parametritis; but intractable sciatica, developing after the menopause, is significant. When a patient with these symptoms applies to her physician she ought certainly to be examined, and if the portio does not present a suspicious appearance, search should be made for cancer higher up in the cervix or corpus uteri. Fragments should be removed for microscopical examination. Patients themselves are often to blame since they defer seeking professional advice until too late, because they have no severe pain, the irregular hemorrhages being attributed to the approaching change of life. It is a peculiar fact that women who have cancer are less likely to fear it than those who have not. In conclusion, the writer urges that both physicians and patients should be trained to recognize the initial symptoms of cancer of the uterus, and to have the diagnosis settled at once.

PSEUDO-INTRALIGAMENTOUS OVARIAN TUMORS.

PAWLIK (*Centralblatt für Gynäkologie*, 1891, No. 38) reports seven cases which he thus characterizes. They are usually small ovarian tumors associated with diseased tubes, the disease being of puerperal or gonorrhœal origin. They develop posterior to the broad ligament, to which and to the mesovarium they contract firm, broad adhesions; they are also prone to adhere to the sigmoid flexure and to the bottom of Douglas's pouch. They become covered with pseudo-membranes which closely resemble peritoneum, so that they present the appearance of being actually intra-ligamentous. When the broad ligament is split for the purpose of enucleating the tumor, it will be seen that the latter lies behind the posterior fold. In removing these growths it is advisable to tie off the uterine end of the tube first, then to separate the adhesions from behind and below. By drawing the mass upward the adherent peritoneum forming Douglas's pouch will be elongated in such a way as to form a pedicle. Pressure may be advantageously exerted through the rectum by means of a colpeurynter. The writer prefers the latter method to operation in Trendelenburg's posture, since there is less danger of pus escaping among the intestines.

LOCALIZED METEORISM IN INTESTINAL OBSTRUCTION.

KADER (Inaugural Dissertation: abstract in *Centralblatt für Gynäkologie*, 1891, No. 38) has conducted elaborate experiments on animals, his deductions being as follows: In every case of intestinal obstruction the portion of gut immediately above the point of obstruction becomes distended, but there is no marked increase in the distention in the course of twenty-four hours. When the obstruction is so complete that venous stasis is marked, serious tissue-changes occur in a few hours, which threaten the life of the subject; complete paralysis of the muscle is present and the meteorism is then strictly localized at the affected area, so that it may be readily recognized before the abdomen is opened.

PRIMARY CANCER OF THE VAGINA.

HECHT (Inaugural Dissertation: abstract in *Centralblatt für Gynäkologie*, 1891, No. 38) has made an exhaustive study of the literature of this subject. Among 4507 cases of cancer in females who were examined at the Vienna clinics in ten years he found only 50 cases of primary cancer of the vagina, or 1.1 per cent. It was most frequent between the ages of thirty and forty. Among the probable etiological factors were excessive childbearing and mechanical irritation, such as long-standing prolapsus and the wearing of pessaries. The disease appears under two forms—the cancrroid and the diffuse scirrhus—and is usually located on the posterior wall. The initial symptoms are profuse leucorrhœa, which later becomes a foul watery discharge, and irregular hemorrhages during coitus and defecation. Later, pain and vesical symptoms appear. The portio and external genitals are involved late, if at all, but the lymph-glands are usually affected. Metastases are rare; among the whole number of cases analyzed there were only two of general carcinosis. Death is due to exhaustion. It is sometimes difficult to distinguish primary cancer of the vagina from disease originating in the portio; condyloma, sloughing fibrous polypus and sarcoma are distinguishable microscopically. The only treatment is radical removal with knife, scissors, or sharp spoon, followed by thorough cauterization. Cæsarean section has been performed on account of obstruction due to cancer of the vagina, but with bad results, only two patients having been saved out of twelve.

THE DIAGNOSIS OF NON-PUERPERAL ABSCESS OF THE OVARY.

RHEINSTEIN (*Archiv für Gynäkologie*, Band xxxix., Heft 2) thinks that acute inflammation of the ovary is rarely observed outside of the puerperal state. The follicular form described by Slavjansky, which occurs in acute exanthemata, possesses rather an anatomical than a clinical interest. The interstitial form is very seldom encountered, except in the puerpera, when it is practically impossible to distinguish it from localized peritonitis.

Olshausen admits that a probable diagnosis can be made only when the enlarged ovary can be felt and the pain localized in it. The writer believes that it is only possible when the gradual enlargement of the affected gland has been traced from the outset by the finger of the observer, all other inflammatory conditions in the same region having been excluded. It is doubtful if a positive diagnosis can ever be made before the abdomen is opened.

The following illustrative case is cited: An unmarried woman, æt. twenty-three years, had aborted in June, 1888, and recovered without sequelæ. In November, 1889, she was sick with acute rheumatism for a month and had leucorrhœa, but no other local trouble. In February of the same year she had a chill and fever at the beginning of a menstrual period, accompanied with pain in the left side. The fever persisted, and the pain became so severe that she was often unable to go about. When admitted to the hospital she had an evening temperature of 101.6°; her abdomen was tense but not sensitive on pressure, with the exception of slight tenderness in the left iliac region. To the left of the uterus could be felt an intra-pelvic tumor, as large as an apple, perfectly movable, its consistence being generally hard, but

with soft spots. The diagnosis of suppurative disease of the right adnexa was made, laparotomy was performed, and a pus sac was found so firmly adherent to the intestines that a considerable portion of it was left behind. The patient made a good recovery. On microscopical examination of the specimen remains of ovarian stroma were found, but no traces of ovisacs. This fact, together with the location of the abscess behind the broad ligament, indicated its origin.

The history of the case seemed to point to pyosalpinx, but the latter condition does not, as a rule, develop so rapidly; moreover, the tumor was unilateral, which is seldom the case with pyosalpinx. On vaginal examination the mass was felt to be circumscribed, and could not be traced outward from the cornu uteri. The pain and fluctuation in the mass were not characteristic. As regards the etiology, it might be referred to gonorrhœal infection, the virus having perhaps entered a ruptured ovisac during or just after menstruation and caused an abscess of the ovary before there was time for the development of a corresponding pyosalpinx.

[The writer's review of the literature of the subject has been superficial, else he would not have overlooked a number of cases of non-puerperal ovarian abscess that have been reported at the New York Obstetrical Society, especially at a recent meeting. The condition is certainly not so rare as he states. We are surprised that he makes no reference to the differential diagnosis of abscess of the ovary and perityphlitic abscess—which is frequently impossible, especially when the suppurating ovary is buried in coils of intestine high up in the pelvis, so that it cannot be felt *per vaginam*, and when the sac ruptures into the gut. We have had two cases in which, after careful observation, laparotomy was performed for appendicitis and revealed the presence of ovarian abscess.—ED.]

PÆDIATRICS.

UNDER THE CHARGE OF

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A. F. CURRIER, M.D.,

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AND

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THE USE OF STROPHANTHUS IN CHILDREN.

DEMME reports (*Jahrbuch f. Kinderheilk.*, xxxi., Nos. 1 and 2) that a 1:20 preparation of tincture of strophanthus produces a strengthening of the systolic contraction of the frog's heart somewhat less decided than is produced by digitalis. This effect can be sustained a long time by careful dosage, but as the dosage is increased the contractile force diminishes and gradually a cessation in systole results. The toxic effect of strophanthus on the heart-muscle may occur unexpectedly and more suddenly than with digitalis, hence the necessity of great caution in administering the drug to

children. Strophanthus also causes a prolongation of the diastole and a diminution in the frequency of the pulse as long as the energy of the systole increases. The author used the drug in seven cases of uncomplicated mitral disease, in five of scarlatinal nephritis, in three of exudative pleuritis, and in two each of bronchial asthma, pulmonary tuberculosis, and whooping-cough in children between five and fifteen years of age. Dyspepsia was produced in the younger children, so that the treatment could not be continued. The initial dose for children from five to ten years of age was one drop, three times daily; for older children, one drop, four times daily. After four to seven days the dose was increased to three drops four or five times daily. Nausea and cold-sweating indicated a suspension of the treatment and the administration of wine, cognac, or coffee. In heart-failure diuresis was increased after three or four days, the pulse becoming slower and stronger and the breathing easier. The dropsical phenomena became less marked. The diuretic effect ceased after three or four days in five of the cases of mitral disease, and compensation could be effected only by the combined action of strophanthus with digitalis. A prompt diuretic effect was produced by strophanthus in two of the cases of chronic scarlatinal nephritis, while in the acute cases no benefit was experienced. The effect in exudative pleuritis was satisfactory, and also in the two cases of bronchial asthma, in which strophanthus was given in connection with iodide of potassium. In pulmonary phthisis no positive result was observed, but in the two cases of whooping-cough, in which there was persistent dyspnoea and oedema of the lower extremities in consequence of dilatation of the heart, the results were satisfactory. The action of strophanthus consists in elevation of the blood-pressure and favorable influence upon the respiratory centre. It can complete the action of digitalis when both drugs are given, and neither cumulative effect nor diminished activity were observed in cases in which it was used during a long period.

BRONCHIECTASIS IN YOUNG CHILDREN.

The subject of bronchiectasis receives but scanty notice in the ordinary works on children's diseases.

In the new Cyclopædia by Keating it is not even mentioned. In the recent text-book by Ashby and Wright it is dismissed in a few sentences as a complication of broncho-pneumonia. Henoch only briefly refers to it as an occasional result of chronic pneumonia. In Dr. Charles West's lectures it is merely incidentally mentioned under bronchitis. Goodheart says that it occurs mostly between five and nine years of age, and that bad pertussis frequently precedes it. Eustace Smith describes it under the head of "fibroid induration of the lung," but says that cirrhosis of the lung rarely attacks infants, and is usually found in children of five years old and upward; but J. WALTER CARR (*The Practitioner*, London, 1891) records four cases whose ages are as follows: Five and three-quarters years, sixteen months, two years, eleven months.

Yet it is probable that bronchiectasis is by no means uncommon in childhood, though during life it is undoubtedly very apt to be overlooked, the case being regarded merely as one of bronchitis—with which it is usually coexistent—or, perhaps, in the later stages as one of phthisis. Moreover, the

supervention of bronchiectasis, though it seriously increases the gravity of the prognosis, does not, so far as we know, call for any important modification in treatment.

As regards etiology and pathology, the cases given illustrate fairly well the chief ways in which the disease may arise. It is, of course, always secondary to some antecedent lung trouble—bronchitis, pneumonia, or pleurisy. It is true that the acute specifics, especially measles and whooping-cough, are frequently its precursors.

We must remember that, whilst for convenience of description and of teaching we classify and describe bronchitis, collapse, broncho-pneumonia, lobar pneumonia, pleurisy, etc., in reality these conditions are generally intermixed—more so in children than in adults, and most of all in young children.

Some recorded cases, in which the bronchiectasis seems to have been congenital, were probably due to congenital atelectasis, the unexpanded pulmonary parenchyma having been gradually converted into fibrous tissue, which, subsequently contracting, caused a purely secondary bronchial dilatation.

The physical signs alone suggest, as a rule, a very rapid destruction of lung tissue. The most important points were the gradual supervention upon the ordinary evidences of bronchitis or broncho-pneumonia of distinct cavernous signs, with moderately loud gurgling and bubbling râles, and the variations from day to day in the number and character of these moist sounds. In some of the cases the variability in the physical signs, of course, pointed strongly to bronchial dilatation.

Bronchiectasis limited to part of one lung may be almost indistinguishable from a localized empyema; both are often preceded by a broncho-pneumonia. The loud, gurgling râles in the former condition may help in the diagnosis, but in many instances only the aspirating-needle will decide; and in such cases it may be well to remember the possible danger of penetrating a dilated bronchus, as was done in the second case of Carr.

The prognosis must necessarily be bad if the disease be at all extensive; but the cases show that it must be founded on the results of repeated physical examinations of the chest rather than on delusive hopes which may for a time be afforded by an improvement in the child's general condition. At the same time it is necessary to remember that the physical signs alone would seem to justify a far more immediately serious prognosis than experience shows to be correct.

A NEW METHOD OF DRESSING THE CHEST IN PNEUMONIA, PLEURISY, PLEURODYNIA, ETC.

WILLIAM HUNT (*Annals of Gynecology and Paediatrics*, 1891) advises the following method to dress the chest in a case of pneumonia, pleurisy, pleurodynia, etc.:

Do it on a large scale, in the same way that we now dress abrasions, bruises, etc.

If there is to be any cupping or other preliminary operation, have that attended to; then all the ingredients wanting are pure collodion and absorbent cotton, in smooth layers, and a good broad brush, like a mucilage-brush.

FELLOWS' HYPO-PHOS-PHITES

(Syr: Hypophos: Comp: Fellows)

Contains **The Essential Elements** to the Animal Organization—Potash and Lime.

The **Oxydizing Agents**—Iron and Manganese;

The **Tonics**—Quinine and Strychnine;

And the **Vitalizing Constituent**—Phosphorus,
Combined in the form of a Syrup, with *slight alkaline reaction*.

It **Differs in Effect** from all others, being pleasant to taste, acceptable to the stomach, and harmless under prolonged use.

It **Has Sustained a High Reputation** in America and England for efficiency in the treatment of Pulmonary Tuberculosis, Chronic Bronchitis, and other affections of the respiratory organs, and is employed also in various nervous and debilitating diseases with success.

Its **Curative Properties** are largely attributable to Stimulant, Tonic, and Nutritive qualities, whereby the various organic functions are recruited.

In **Cases** where innervating constitutional treatment is applied, and tonic treatment is desirable, this preparation will be found to act with safety and satisfaction.

Its **Action is Prompt**; stimulating the appetite and the digestion, it promotes assimilation, and enters directly into the circulation with the food products.

The **Prescribed Dose** produces a feeling of buoyancy, removing depression or melancholy, and hence is of great value in the Treatment of MENTAL AND NERVOUS AFFECTIONS.

From its exerting a double tonic effect and influencing a healthy flow of the secretions, its use is indicated in a wide range of diseases.

PREPARED BY

JAMES I. FELLOWS, CHEMIST,

48 VESEY STREET - - - - - NEW YORK.

Circulars and Samples Sent to Physicians on Application.

PUBLIC HEALTH.

UNDER THE CHARGE OF

EDWARD F. WILLOUGHBY, M.D.,
OF LONDON.

THE BACILLUS OF DIPHTHERIA.

Although the multiplicity of bacteria present in the "false membrane" of most cases of diphtheria has induced persons of a sceptical disposition, and not practically familiar with bacteriological manipulation, to question the existence of a specific pathogenic microbe in this disease, there can be no reasonable doubt as to the claims of that known as Klebs-Löffler's to this character, and such being the case its detection affords a ready and positive means of diagnosis in difficult cases. We have long insisted that diphtheria is a disease of far more frequent occurrence than many medical men are inclined to admit, and that not only should all, or nearly all, cases of so-called "membranous croup" and of deaths referred to croup be returned as laryngeal diphtheria, but that the great majority of tonsillites, pharyngites, and post-nasal catarrhs plainly originating in insanitary conditions are really diphtheritic, as is occasionally shown by the occurrence of unmistakable cases of diphtheria in families where such suspicious "sore-throats" have already been observed. We do not, however, deny that there are or may be sore-throats of septic origin which are not specific, or that a foul tonsillitis or pharyngitis of the simply catarrhal kind may, at times, assume a more alarming character than many cases of mild diphtheria; but considering the insidious course that the latter often exhibit, arousing no suspicion of danger until the fatal termination is imminent, and the fact that those which pass off favorably may be the means of communicating the infection in a virulent form to other and more susceptible subjects, a ready means of diagnosis—some pathognomonic symptom or characteristic phenomenon, if such could be found—would be of inestimable value to the physician.

Such, we are convinced, is to be obtained in the detection of the Klebs-Löffler bacillus, and we commend a careful perusal of the "Contributions to the Study of Diphtheria," by MM. E. ROUX and A. YERSIN in recent numbers of the *Annales de l'Institut Pasteur*. The method followed by these experimenters is to remove a fragment of the "false membrane" or exudation from the throat by a piece of cotton-wool held in a long forceps. This is then dried on blotting-paper and rubbed between microscopic glass covers, care being taken that the smear be produced by particles of the membrane itself and not by the salivary mucus and epithelium. The glasses, previously dried and passed through the flame of a spirit lamp, are stained, one by Löffler's blue, the other by gentian-violet after the method of Gram. The preparation, washed in water, is examined with a homogeneous immersion objective. The diphtheritic bacilli appear, among other microbes, in the

Apply a very thin layer over the side affected, from spinal column to sternum, and secure it with collodion smeared thoroughly over it. Then go on with thicker layers, securing them with collodion until a good padding is obtained, paying particular attention to the edges. In double cases you can act accordingly. The advantages are:

1. The one dressing, if well applied, will last throughout the case; thus
2. The fatigue and discomfort of frequent poulticing are avoided.
3. The side, in single cases, is held as in a splint, while the free side does the breathing. A first-class non-conductor is covering the chest. It is possible that the contracting collodion may have some influence in controlling the blood-supply.
4. There is no particular interference, in one who has a good ear, with physical examination. May be it would be a good thing if there was; for having once made the diagnosis, what is the use of exhausting the patient every day by trying to find out whether one-eighth of an inch, more or less, is involved? The general symptoms will tell that.

PLEURITIC EFFUSION IN CHILDREN.

HERBERT B. WHITNEY, in the *Denver Medical Times*, in reporting ten cases of latent serous effusion into the pleuræ of children aged respectively two and four years, remarks that there is little value in Smith's remarkable statement as to the variation in the line of flatness on change of posture. No such variation in the level of the fluid ever takes place in a pleuritic effusion at any age. It does occur in pneumo-hydrothorax, and possibly, also, in simple hydrothorax; but that books should still mention this as a sign of pleuritic effusion can only be explained by the well-known frequency with which errors of this sort are handed down from author to author. The laws which govern the shape and position assumed by a lung under pressure are difficult to determine, but one thing is certain: the lung does not simply float about on the surface of the fluid, nor do either lung or fluid readily alter their relative position. Whitney considers the curve of the upper line of flatness to be pathognomonic. This line has two varieties, according to the amount of effusion, the one being a simple curved line with upward convexity, and the other, more characteristic, the so-called "letter S" curve. This second variety of curve, which appears abruptly as soon as the effusion gets beyond a certain size, was first described by Garland, of Boston, as the "letter S" curve. The curve is found only in effusions of moderate extent; in a very large effusion the line becomes again a simple curve, but this time with upward concavity. This "letter S" curve, beginning at the sixth, seventh, or eighth dorsal vertebra, according to the amount of fluid, passes first outward, then upward, and is lost for a while in the upper axilla, or shoulder-joint; appearing again anteriorly, it either passes downward with a gradual slant to the base of the lung, or, in larger effusions, it passes more horizontally inward along one of the ribs to the sternum.

showing that while the latter experimented with the true one, the former made these observations on the false, though in his inoculations Löffler must have used the pathogenetic form.

According to Dr. Klein, the surest way to obtain pure cultures of the specific bacillus of diphtheria is to wash the pieces of membrane by shaking them up in three successive portions of sterilized solution of common salt, and from the particles in the last to sow plate cultivations on solid serum-gelatin.

The bacilli in diphtheria, as it occurs in the human subject, are confined to the false membrane and perhaps the subjacent tissue; at any rate, they are never found in the blood—a fact which suggests irresistibly that the phenomena, febrile, neurotic, etc., of the disease are caused by the absorption of ptomaines, toxins, or other matters produced by the bacilli, which themselves remain in the original site. This supposition is confirmed by the fact that when guinea-pigs or other animals are inoculated subcutaneously with pure cultures of the bacillus, sections of the tumor produced exhibit under the microscope appearances closely resembling those of the diphtheritic tissue from the human pharynx, but that, though the general phenomena of the disease, nephritis, etc., are induced, the bacilli cannot be found in the blood.

Klein has, however, detected them in the neighboring lymphatic vessels and glands, and has obtained pure cultures from these; but this very limited extension, which we do not doubt would be found to apply to the inflamed submaxillary glands in man, and would indeed seem inevitable, does not detract from the local character of the primary process, and though the usual mode of infection by inhalation or imbibition would, at first sight, seem to offer a ready explanation of this localization in the pharynx, larynx, or nares in man, Dr. Klein's remarkable observations on the cow point to some more occult causes varying with the peculiar constitution of the animal.

The occasional appearance of a similar false membrane on the vaginal or other mucous membranes, and on parts of the skin denuded by blisters, by abrasions, or eczema, and on the surface of wounds, would seem to be comparable to the experimental inoculations in animals.

The theory which attributes the general phenomena to toxins, is fully confirmed by further experiments of Roux and Yersin, who separated the bacilli and their chemical products from artificial cultivations, and by injection of the latter alone produced in guinea-pigs all the general effects of the disease without any local manifestations whatever.

Dr. Thursfield, Dr. Downes, and Mr. Shirley Murphy have recently reported cases in which cats had been ill, and in some instances died, from a disease of the respiratory organs, and children who had played with and nursed them had sickened soon after with diphtheria, and others in which cats had been affected in like manner after association with children suffering from diphtheria. In two instances, post-mortem examinations of the cats revealed, besides evidence of broncho-pneumonia, renal lesions identical with those observed in diphtheria.

Doubts have been expressed as to the identity of the natural diphtheria of cats with that of man, from the fact that, though artificial inoculation of the pharynx or nares may lead to local manifestations resembling those of

form of unequally stained slender rods, often grouped in masses, and with ends rounded, slightly curved, and pear- or club-shaped.

Instead of Löffler's blue, another composed of dahlia-violet and methyl-green may be used with advantage. One part of a one per cent. watery solution of the violet is to be mixed with three parts of a similar solution of the green, and enough distilled water then added to give a fine but not too dark a blue tint. This solution is very stable and does not deposit on standing. One drop is placed on a clean cover, which is to be immediately applied to another on which is the object to be stained. With either solution the specific bacilli take up the color sooner and more deeply than do the other microbes, and a little practice makes their recognition an easy matter.

In some typical cases the exudation is almost a pure culture of Löffler's bacillus, and it is always more abundant in portions of membrane taken from the pharynx than in those removed from the larynx after tracheotomy. In foetid putrefying membranes the proportion of other microbes is greatest. The like predominance of saprophytes is observed as the case progresses toward recovery; and even at the commencement of the attack such a disparity between the numbers of specific and indifferent bacteria may justify a favorable prognosis.

Should any difficulty be experienced in discovering the bacilli, portions of the membrane may be hardened in alcohol and sections stained by Gram's method, when beneath the superficial layer, rich in common microbes, the specific bacilli will be seen in well-defined groups.

If the membrane be rapidly dried on linen or blotting-paper, its subsequent desiccation scarcely interferes with the staining process, so that the examination may be made by an expert on specimens sent through the post by medical men who have not the means of doing it themselves. But with a proper microscope and a little practice a few minutes is generally sufficient to obtain satisfactory evidence as to the nature of any given case.

For pure cultures, coagulated serum is by far the best medium, and in it sowings of the false membrane give rise to colonies of the specific bacillus within twenty-four hours, before saprophytes, or the streptococci always present in the exudation, have begun to grow.

This cultivation in gelatin-serum is, indeed, essential to an absolute diagnosis, for, as Dr. Klein has shown,¹ there are two forms of the Klebs-Löffler bacilli, which he calls Nos. 1 and 2, but which would be better described as two species of bacillus morphologically alike, though distinguishable by their behavior in gelatin cultures. No. 1 is not constantly present in diphtheria, and does not act pathogenetically on animals; in fact, is not the specific bacillus or cause of the disease, which the so-called No. 2 is. The pseudo-diphtheritic bacillus, or No. 1, grows freely enough in pure serum, but not on serum rendered solid by gelatin at temperatures of 70-72° F., which the true bacillus of diphtheria does. Hitherto no one seems to have been aware of the existence of the two forms, for Löffler himself and Flügge state that the bacillus does not grow in gelatin at temperatures below 76° F., while Zarniko and Escherich assert positively that it does so even below 72° F., clearly

¹ Report of Medical Officer of Local Government Board.

diameter, but the majority were not more than one-fourth or even one-eighth of an inch across.

The milk drawn from these cows on the fifth day, before even a single papule had made its appearance, was found to be so charged with the bacillus of diphtheria that thirty-two colonies free from any admixture of other bacteria were obtained in pure cultures from one cubic centimetre of milk. When the vesicles first appeared, their serous contents were examined and found to be swarming with the bacilli, as were those of the succeeding pustules up to the last.

These experiments, conducted with every antiseptic and other precaution, demonstrate unequivocally the fact that in the cow the localization of the bacterial phenomena of the disease tends to the udder, and that the milk contains the bacilli in enormous numbers, though the means by which they are conveyed from a distant inoculation are extremely difficult to conceive, and can only be explained by further observations. It may be that the bacilli are not restricted as in man and the rodents to the site or proximity of their entry. It was by some of this milk, taken before the formation of the papules and while the teats were to all appearances perfectly sound and healthy, having been unintentionally given to a couple of cats that the epidemic among those animals in the Institute was set up.

For the post-mortem appearances presented by the cows, as well as the cats, and other details, we must refer our readers to the report of the Medical Officer to the Local Government Board, 1888-89; we have here only space for so much of Dr. Klein's discoveries as directly bears on and proves the fact that the cow is susceptible of diphtheria, and that, while in seeming health, her milk may be charged with the specific bacillus and be an active medium for the communication of the disease to mankind.

Corrigendum.—The order of figures 3 and 4, pp. 381 and 383 of the October issue, has been erroneously reversed; the description of each figure applies to the other.

Note to Contributors.—All contributions intended for insertion in the Original Department of this Journal are only received *with the distinct understanding that they are contributed exclusively to this Journal.*

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diphtheria in man, the natural disease in the cat is distinctly pulmonary. But no one now questions the identity of human and bovine tuberculosis, though the peculiar lesions presented by the pleura in Perlsucht were formerly urged as evidence to the contrary. This, however, is by no means the only instance of a specific and communicable disease producing different phenomena, "accidents" in the logical sense of the word, in different animals, and the experiments of Klein at the Brown Institute in the production of diphtheria in cats by the use of infected milk, have confirmed the suggestion that in that animal the lung is the chief seat of the morbid phenomena, while the same tendency to pulmonary localization was observed in other cats that were subsequently infected by association with these.

A far more important question from a standpoint of practical hygiene is the communicability of diphtheria by means of milk. That such a mode of propagating the disease is possible, has been amply proved by the history of numerous epidemics. The evidence, however, had hitherto been wholly circumstantial, though none the less conclusive. We mean that the questions had not been solved, whether the milk served merely as a vehicle, perhaps a cultivation fluid also, but merely as a vehicle for the conveyance of the poison from man to man, as from the milker or dealer to the consumer, or whether the cow herself were capable of contracting the disease and thus becoming an active intermediary. We are not aware of any observations on the effects of the milk of nursing mothers suffering from diphtheria, but it is quite conceivable that such milk, whether of woman or cow, would, by being impregnated with the toxins present in the blood, acquire highly poisonous properties. At the same time, the experiments of Roux and Yersin with the pure chemical products of artificial cultures, suggest by analogy that the disease induced by the use of such milk would, though resembling diphtheria in its general phenomena, be marked by the absence of the bacilli and of the local manifestations of their action on the pharyngeal mucous membrane. This would not be the case were the cow to be inoculated on her udders by the hands of an infected milker, and such a contingency is not improbable.

But Dr. Klein, having learnt that in one undoubted instance of the spread of diphtheria by means of milk, the cows at the incupated dairy, though apparently in good health, had suffered from "chaps" on their udders, determined to investigate the whole question experimentally. He inoculated two cows with pure cultures from a case of human diphtheria, using a Pravaz syringe and selecting the subcutaneous tissue of the shoulder as a neutral or indifferent spot. A swelling appeared, attended by some febrile disturbance and loss of appetite, but it, as well as the general symptoms, subsided after the third day. Between the eighth and tenth days, they began to suffer from a slight cough, and they left off feeding on the twelfth and twenty-third days respectively. The former died on the fifteenth and the latter was killed on the twenty-fifth. In both, from the fifth to the eleventh days, in fact, during the interval of freedom from any evidence of general disease, a succession of papules appeared on the teats. These papules were followed by vesicles, changing into pustules and ultimately forming brown or black crusts, which fell off in the course of five to seven days, leaving dry healing sores. Some of the vesicles and pustules were one-half or three-fourths of an inch in

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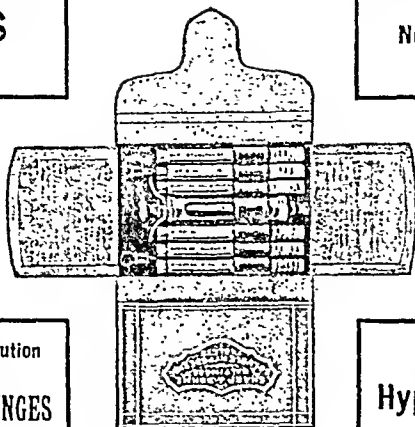
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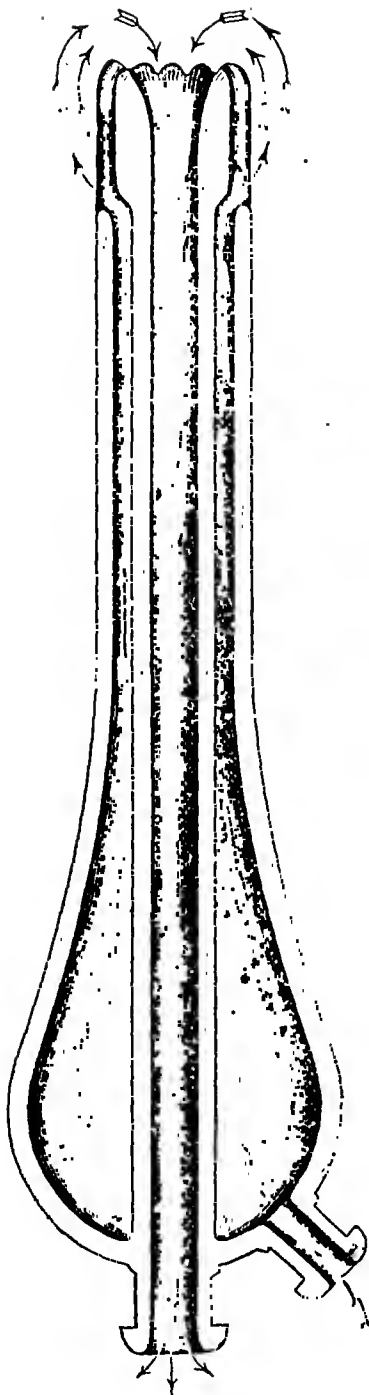
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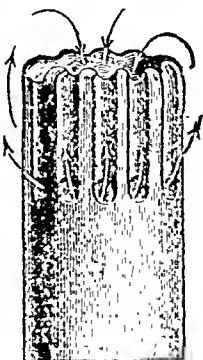
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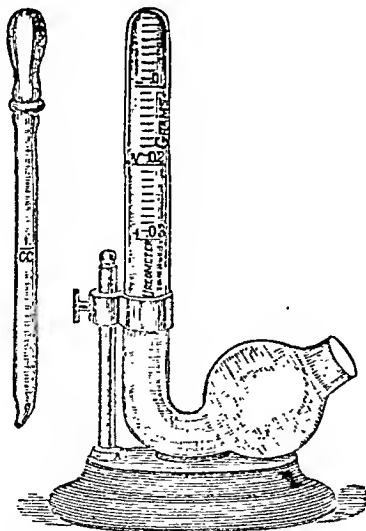
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Every fluid drachm contains fifteen grains EACH of Pure Chloral Hydrat. and purified Brom. Pot. and one-eighth grain EACH of gen. im. ext. Cannabis Ind. and Hyoseyam.

DOSE.—

One-half to one fluid drachm in WATER or SYRUP every hour, until sleep is produced.

INDICATIONS.—

Sleeplessness, Nervousness, Neuralgia, Headache, Convulsions, Colic, Mania, Epilepsy, Irritability, etc. In the restlessness and delirium of fevers it is absolutely invaluable.

IT DOES NOT LOCK UP THE SECRETIONS.

PAPINE

THE ANODYNE.

PAPINE IS THE ANODYNE OR PAIN-RELIEVING PRINCIPLE OF OPIUM, THE NARCOTIC AND CONVULSIVE ELEMENTS BEING ELIMINATED. IT HAS LESS TENDENCY TO CAUSE NAUSEA, VOMITING, CONSTIPATION, ETC.

INDICATIONS.—

Same as Opium or Morphia.

DOSE.—

ONE FLUID DRACHM—(represents the Anodyne principle of one-eighth grain of Morphia).

IODIA

THE ALTERATIVE AND UTERINE TONIC
FORMULA.—

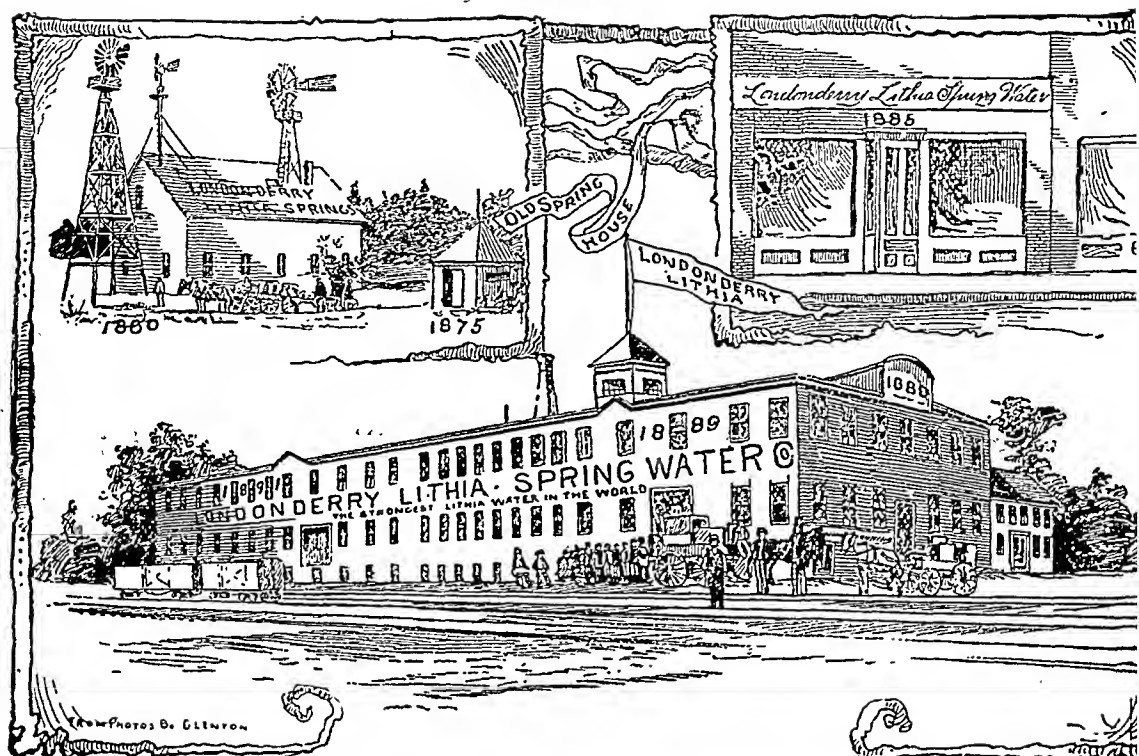
Iodia is a combination of active principles obtained from the Green Roots of Stillingia, Helonias, Saxifraga, Menispermum and Aromatics. Each fluid drachm also contains five grains Iod. Potas. and three grains Phos. Iron.

DOSE.—

One or two fluid drachms (more or less as indicated) three times a day, before meals.

INDICATIONS.—

Syphilitic, Scrofulous and Cutaneous Diseases, Dysmenorrhea, Menorrhagia, Leucorrhea, Amenorrhea, Impaired Vitality, Habitual Abortions and General Uterine Debility.



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FORMULA.

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Tinct. Nux Strychnos	- - - - -	1 minim.
" Ignatia Amara	- - - - -	1 "
" Cinchona	- - - - -	4 "
" Matricaria	- - - - -	1 "
" Gentian	- - - - -	1/2 "
" Columbo	- - - - -	1/2 "
" Phosphorus, C. P.	- - - - -	1-300 gr.
Aromatics	- - - - -	2 minims.

Dose: 5 to 10 drops in 2 tablespoonfuls of water.

INDICATIONS.

Paralysis, Neurasthenia, Sick and Nervous Headache, Dyspepsia, Epilepsy, Locomotor-Ataxia, Insomnia, Debility of Old Age, and in the treatment of Mental and Nervous Diseases.

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The success of Fellows' Syrup of Hypophosphites has tempted certain persons to offer imitations of it for sale. Mr. Fellows, who has examined samples of several of these, *finds that no two of them are identical*, and that all of them differ from the original in composition, in freedom from acid reaction, in susceptibility to the effects of oxygen when exposed to light or heat, *in the property of retaining the strychnine in solution*, and in the medicinal effects.

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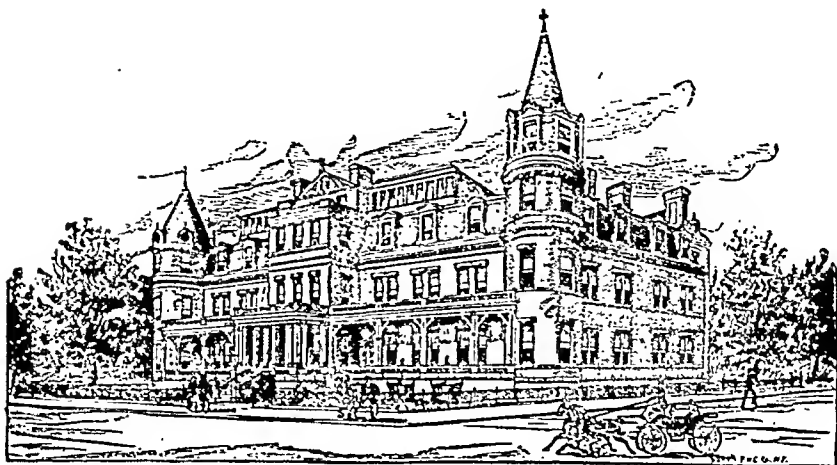
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Have been treated within its walls. In consequence of the acquired experience, showing the advisability of such a course, arrangements have been made to enlarge the scope of the Sanitarium by establishing two additional departments—one for the Diseases peculiar to Women, and one for the Diseases of the Throat and Nose. The department of

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Will be under the immediate charge of Dr. E. L. TOMPKINS, who, as house physician and surgeon of the New York Post-Graduate Medical School and Hospital, and as one of the physicians of the Gynecological Department of the Demilt Dispensary, New York City, and further, during his service of two years as resident physician of the Hammond Sanitarium, has acquired large experience in Gynecological Medicine and Surgery. The department of

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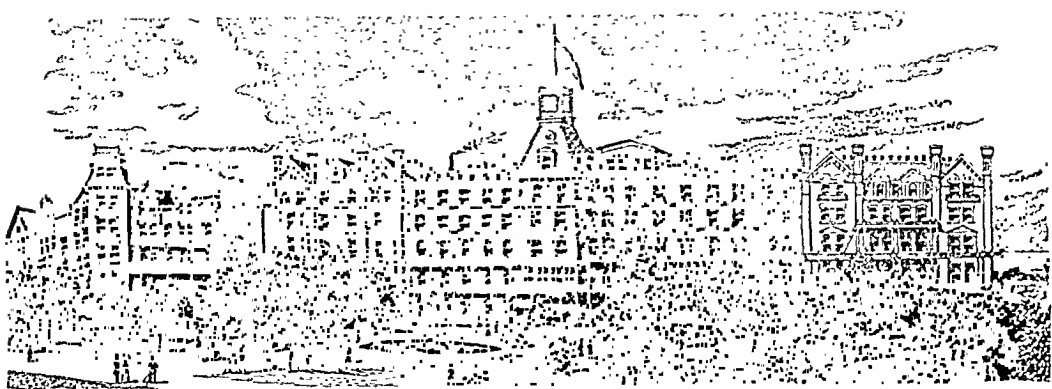
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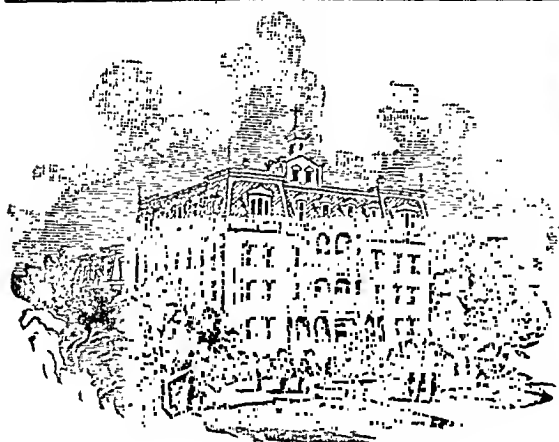
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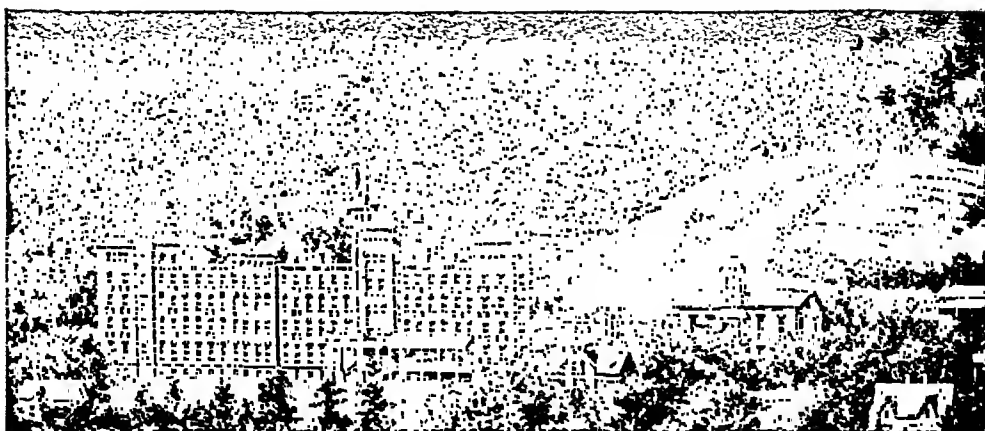
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There is a better way than that. When from the whirl of society or the unremitting cares of business, by wild excesses or a long strain of necessary toil and vigilance, the patient is brought to the verge of nervous prostration, the proper treatment, besides rest, sleep and recreation, is a remedy which will impart the proper nourishment to the system and thus restore it to its normal tone again. This remedy is the chemically pure hypophosphites of lime and soda. A recollection of its well known tissue-regenerating power will suggest to the mind of every physician the value of its action in this condition.

In obstetrical practice often the patient's nervous system is kept irritable by the impoverishment consequent upon nourishing the developing embryo. The nutritive hypophosphites

(lime and soda) should be given in interrupted periods throughout the course of gestation.

In gynecological practice there are many patients suspected of having diseased conditions of the pelvic organs to account for their obscure nervous troubles, but who, after the most skillful local treatment, are found to be suffering from a general condition which is aptly termed "nerve starvation." In addition to rest, sleep, nourishing food and hygienic habits, they should take the hypophosphites. By this means the nervous system may be regenerated, and the hysterical irritability will be greatly improved.

Try it also in intractable cases of neuralgia and in functional impotence. Try it wherever you have troubles arising from impoverishment or malnutrition of nerve structure.

Bear in mind that it is not the phosphates (that have undergone their final changes and hence are ready to be rejected at once by the system) that we recommend for this purpose, but the hypophosphites, which, in the process of assimilation, undergo the changes into phosphites and finally phosphates, and while undergoing those changes unite with the organic cell elements. These will be found beneficial.

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The Authors have made a text-book which is in every way quite worthy to take a place beside the best treatises of the period.—*New York Medical Journal*, July 2, 1887.

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Dr. Charles' manual admirably fulfils its intention of giving his readers, on the one hand, a summary, comprehensive but remarkably compact, of the mass of facts in the sciences which have become indispensable to the physician; and, on the other hand, of a system of practical directions so minute that analyses often considered formidable may be pursued by any intelligent person.—*Archives of Medicine*, Dec. 1884.

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The Diseases of Women. Including their Pathology, Causation, Symptoms, Diagnosis and Treatment. A Manual for Students and Practitioners. By ARTHUR W. EDIS, M. D., Lond., F. R. C. P., M. R. C. S., Assist. Obstetric Physician to Middlesex Hospital, late Physician to British Lying-in Hospital. In one handsome octavo volume of 576 pages, with 148 illustrations. Cloth, \$3.00; leather, \$4.00.

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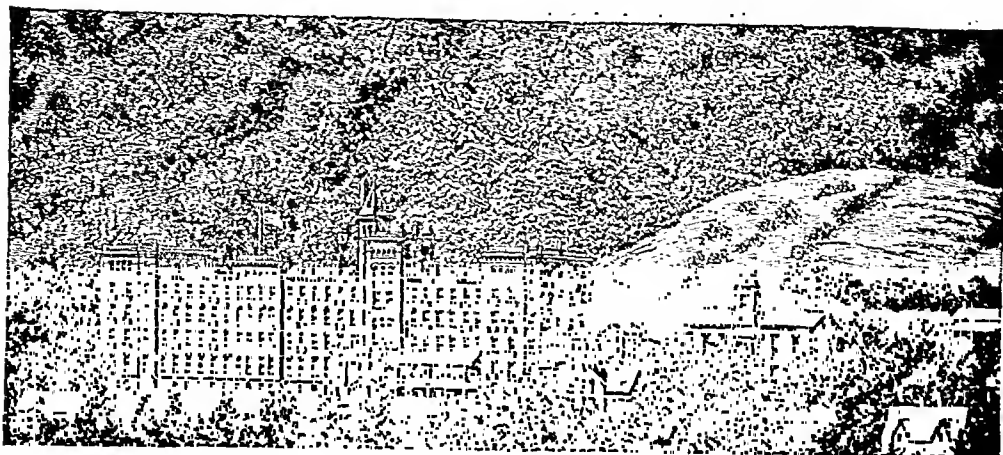
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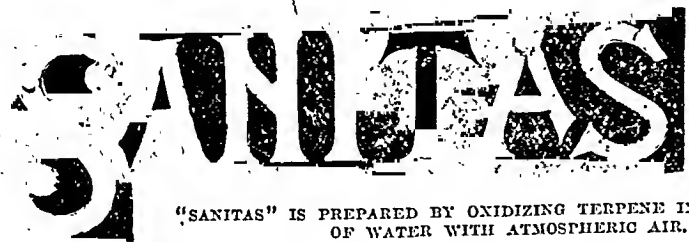
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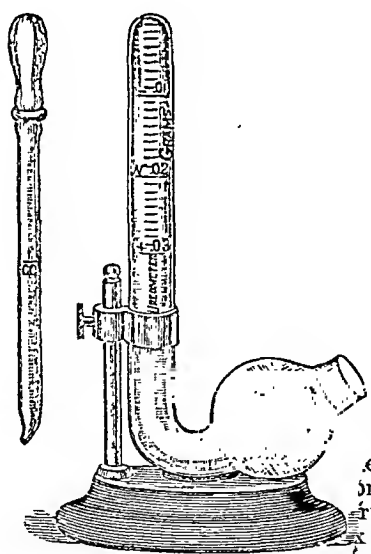
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OTOLOGY.

	PAGE		PAGE
Operation for Exostosis of the External Auditory Meatus	197	Suppuration of the Tympanic Attic and Perforation in Shrapnell's Membrane	199
Case of Injury of the Bulb of the Internal Jugular Vein	198	Neuritis occurring in the Acoustic Nerve as the Result of Meningitis	200
Aural Complications of Grippe	199		

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

Gunshot-wound of the Pharynx and Lodgement of the Missile without any Subjective Symptoms of its Presence	200	Laryngitis	201
		Myxoma of the Epiglottis	201
		Nasal Hydrorrhœa	201
		Look Beyond the Nose	201

DERMATOLOGY.

Immigrant Dermatoses	202	The Influence of Medicaments upon the Culture of the Achorion Schönleinii and Trichophyton	203
Alopecia Areata following Influenza	202	Diagnosis of Paget's Disease of the Nipple and Breast	204
Hereditary Canities	202		
The Absorption of Medicaments from Ointments	203		

OBSTETRICS.

Study of Urine of the Newborn Child	205	Obstructed Labor	207
Configuration of the Fœtal Head	205	A Hitherto Unrecognized Cause for Amniotic Bands and Adhesions	207
Ten Cases of Tubal Pregnancy	205	Amniotic Bands and Congenital Amputations	208
A Remarkable Continuance of Pregnancy in spite of Intra-uterine Manipulation	206	Nephritis and Abortion	208
The Treatment of Post-partum Hæmorrhage	206	A Case of Intra-uterine Infection with Typhoid in a Viable Child	208
The Pathogenesis of Eclampsia	206	Post-partum Eclampsia and Eclampsia caused by Fœcal Intoxication	209
The Relation between the Diameters of the Child's Head and those of the Mother	207	Laceration of the Perineum and Vaginal Outlet	209

GYNECOLOGY.

The Treatment of Retroflexion	210	Endothelioma of the Ovary	212
Sarcoma of the Uterus	211	The Condition of the Endometrium in Cancer of the Cervix	213
Reduction of Chronic Inversion of the Uterus by Hydrostatic Pressure	211	Epithelial Growths of the Ovary	213
Pseudomucin in Ovarian Cysts	211	The Anatomy of the Normal Endometrium	214
The Treatment of Abscess of the Tube and Ovary by Vaginal Incision	212	Pelvic, Tubal, and Ovarian Abscesses	214
The More Remote Results of Removing the Ovaries and Tubes	212	Intra-uterine Galvanization a Scientific Error	214

PÆDIATRICS.

Pneumonic Form of Tuberculosis in Children	215	Icterus Neonatorum	216
Salol in the Gastro-intestinal Diseases of Children	216	Nephrotomy for Tumors in Children	217
		The Functions of the Normal and the Diseased Stomach	217

CONTENTS.

ORIGINAL COMMUNICATIONS.

	PAGE
Life-saving Methods in Stillbirths. By WILLIAM T. LUSK, M.D.	109
Obstructive Disease of the Lower Extremity of the Ileum. By JOHN SYER BRISTOWE, M.D. Lond.	116
Remarks on the Treatment of Dermatitis Herpetiformis. By L. A. DUHRING, M.D.	130
A Case of Cystitis, with the Formation of a Thick Epidermal Sheet in the Bladder—Pachydermia Vesicæ. By A. T. CANOT, A.M., M.D.	135
The Treatment of Arterio-venous Aneurism, with Two Cases Treated by Extirpation. By B. FARQUHAR CURTIS, M.D.	142

REVIEWS.

The Microorganisms of the Human Mouth. By Willoughby D. Miller, D.D.S., M.D.	159
Diseases of the Nose and its Accessory Cavities. By W. Spencer Watson, B.M.	160
A Text-book of Practical Therapeutics. By Hobart Amory Hare, B.Sc., M.D.	162
The Croonian Lectures on Cerebral Localization. By David Ferrier, M.D.	163
Sterility in Women, including its Causation and Treatment. By A. W. Edis, M.D.	165
A Dictionary of Practical Medicine. Edited by J. K. Fowler, A.M., M.D.	166
Stricture of the Rectum: A Study of Ninety-six Cases. By C. B. Kelsey, M.D.	168
On the Treatment of Diseases of the Nervous System. By C. W. Suckling, M.D.	169

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

	PAGE		PAGE
Koch's Treatment of Tuberculosis	171	Salol Collodion	178
New Methods of Treating Erysipelas	177	Death from Large Dose of Paraldehyde	178
Whooping-cough	178	Aristol	178

MEDICINE.

The Principles of the Treatment of Diabetes Mellitus	181	The Pathology of Paroxysmal Hæmoglobinuria	187
On the Influence of Hunger on the Susceptibility to Infectious Diseases	182	The Diagnostic Value of Tubercle Bacilli in the Sputum	188
The Nature and Treatment of Tabes	184	Contribution to the Study of the Movements of the Stomach, Pylorus, and Duodenum	180
A Parasitic Protozoa in Carcinomata	186		
Uric-acidæmia	186		

SURGERY.

A Remarkable Case of Intestinal Obstruction	191	Treatment of Certain Forms of Intestinal Obstruction	195
The Treatment of Subcutaneous Rupture of the Ligamentum Patellæ	193	Suture of the Bladder	196
The Operative Treatment of Thrombosis of the Sinuses	194	Emphysema of Gall-bladder	196
		Excision of the Chancre to Abort Syphilis	197

draw the tongue forward and to depress the base to secure a passage for the entrance of air into the lungs. It was, however, nearly three hours, spent in the use of warm baths, cold sprinklings to the surface, and in the alternating resort to Schultze's and Sylvester's methods, before spontaneous respiratory movements were finally established. The next day the child had repeated attacks of tetanus, but these finally grew infrequent, and after twenty-four hours ceased altogether. The child is now robust and healthy, and the joy of a worshipping household.

I grant this story is a familiar one, and yet the incident has stimulated me to treat of the subject of life-saving methods in stillbirths. I do this the more earnestly because I believe the attitude of the profession in general is one of incredulity as regards the efficacy of the means at our disposal to restore the life of children in the more desperate cases of asphyxia. In my experience it is the usual procedure to spank the child, to immerse it in hot and cold water, and then to wrap it in warm cloths and place it by the fire to die. Yet the object of medical practice is to save life, and for my part I regard the rescuing of a newborn infant from impending death to be as distinctly a professional triumph as the saving of life by ovariectomy, by Caesarean section, or by the operation for appendicitis.

To do effective work it is necessary for the physician to make himself familiar with the physiological conditions which occasion the first respiratory act, and the secondary pathological changes which result from suspended animation. For the mechanical resources employed to restore the circulation, and to excite spontaneous respiratory movements, should not be selected by divining-rod methods, but should be natural sequences of our knowledge of the disturbed conditions calling for relief:

It is, of course, well known that during the period of gestation the child remains in a state of apnoea, and that the respiratory function necessary to its development is performed by the placenta. So soon, however, as the child is born, in normal cases, the thorax expands, the diaphragm contracts, and pulmonary respiration is established. The premature establishment of pulmonary respiration while the child is still in the utero-genital passage, owing to the absence of an atmospheric medium, is followed by asphyxia, and is the usual cause of stillbirths.

The reason of the first respiratory movement in the child, whether prior or subsequent to its birth, has long been a subject for speculation. Omitting earlier views, at present two theories contend for supremacy. The one formulated by Schwartz maintains that in all cases the respiratory act is due to disturbed placental circulation, and the consequent lack of oxygen in the blood of the child. Preyer, on the other hand, insists that respiration is a reflex movement provoked by cutaneous stimuli. He admits, however, that a venous condition of the blood favors the

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LIFE-SAVING METHODS IN STILLBIRTHS.

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A FEW weeks ago I was called in consultation to the bedside of a young primipara in advanced labor. I found upon examination that the child's head was low in the pelvis, and that the cervix was very nearly dilated. The pains seemed good, but for the past two hours there had been no progress of the presenting part. The extraction of the head by means of forceps was a simple task, but after its birth it was found that the advance of the shoulders was arrested by the cord, which was short and drawn tightly around the neck. The cord was, therefore, divided with scissors, and the child was rapidly extracted. It had reached the pallid stage of asphyxia. All respiratory action was suspended, and the heart-pulsations had apparently ceased.

The child was placed upon the table and wrapped in warm cloths. The mucus was expelled from the posterior fauces and from the nasal passages by mouth insufflation. A No. 8 English gum catheter was then passed into the trachea, and the aspirated mucus was removed by suction. The quantity of mucus in the bronchial tubes was large, and the catheter had to be introduced many times. After preliminary clearing of the trachea and bronchial tubes, direct insufflation was practised. In ten minutes slight heart movements were observed, but these ceased when insufflation was suspended. A little later the child gasped from time to time, usually it seemed in response to the irritation of the catheter when introduced into the trachea. An hour's perseverance in this plan of treatment was rewarded by the appearance of a little color upon the surface of the child. The latter was then immersed in warm water, and when lifted from the bath a stream of spirits was poured from a height upon the epigastrium. No respiratory movements were excited. Schultze swinging-movements were next resorted to, and were followed by Sylvester's method; but in employing the latter it was found necessary to

abdominal walls, and then cut through the abdominal coverings, the uterine walls, and amniotic sac to the nose of the animal. The nose was then lifted above the saline fluid and exposed to the atmosphere. By means of powerful currents of induced galvanism applied to the nasal organ, respiratory movements were excited, but ceased when the current was removed. It seemed doubtful, however, whether inspiratory acts did occur in either series of experiments, so long as the placental circulation was completely undisturbed. The existence of apnoea in the foetus is not conclusive evidence that the opening of the uterus, or the compression of the uterine walls produces no derangement in the blood-currents of the placenta. The results were often negative at the beginning of the experiment, but as the blood in the umbilical vein darkened, the electric and mechanical irritants produced more and more marked effects.

From these experiments it becomes evident that when the placental respiration is suspended the accumulation of unknown materials in the blood is capable of exciting the respiratory centre in the medulla oblongata of the foetus without the aid of peripheral stimuli; but that the latter are capable of exciting the respiratory act before the internal stimuli have increased sufficiently to induce independent action. Again, it is a familiar fact that in moderate degrees of asphyxia in the newborn, after the irritability of the medulla has been lowered to a point at which no response follows from the venous condition of the blood, external stimuli are still capable of exciting respiratory movements.

Engstrom found, too, that when the foetus had breathed in the amniotic sac, after respirations had ceased, and after the blood in the umbilical vein and arteries had become of the same blue color, and the nose and lips had become cyanotic, it was still possible to excite respirations in some cases by opening the amnion and lifting the head so as to expose it to the air, and in others by pinching the nostrils, the ears, and the mouth. I shall hardly need to apologize for endeavoring to recall to the memory of my readers the peculiarities of the foetal circulation. The arterialized blood in the umbilical vein empties partly into the portal vein and is first distributed to the liver, and in part passes by the ductus venosus into the inferior vena cava. The mingled venous and arterial currents then enter the right auricle, and are in early pregnancy directed by the Eustachian valve across the right auricle to the left auricle, and thence pass to the left ventricle. As the heart contracts the blood is driven from the left ventricle to the aorta, and is thence distributed by the large vessels which spring from the latter to the head and upper extremities. The blood returned from the upper portion of the body by the superior vena cava, enters the right auricle, where it passes in front of the Eustachian valve to the right ventricle. With the advance of gestation, however, a gradual disappearance of the Eustachian valve

action of external stimuli by increasing the irritability of the respiratory centres.

As a contribution to the solution of the questions in dispute, Otto Engstrom¹ has recently reported a series of experiments made by him upon gravid rabbits and guinea-pigs, in Preyer's laboratory. The animals were strapped to a board, and were then immersed in a saline solution (six per cent.), which was kept at blood-heat by a special apparatus. The head of the animal was placed above the fluid. A small incision was then made in the abdominal wall, through which a uterine cornu was allowed to escape into the saline fluid. The uterine walls were next opened opposite the mesenteric attachment at the point of least vascularity. As there was no hemorrhage to stain the saline fluid, it was possible to observe the fetuses through the membranes in the clear amniotic fluid. When this experiment was performed with address and dexterity, the exposed fetus remained in a state of apnoea, and the blood in the umbilical vein possessed a bright-red color, in marked contrast with the dark hue of the blood in the umbilical arteries.

If now the cord was compressed through the membranes by the thumb and index-finger of the warmed hand, or by self-closing compressing forceps applied to the cord near to the placenta, and as far from the fetus as possible, respiration followed in from three to six seconds, and continued until death supervened from asphyxia. The same results followed when the umbilical vein was pricked with a needle, or was divided by scissors. Again, in other cases, to avoid the criticism that external stimuli were not absolutely excluded by the manipulations employed, the mother was asphyxiated by carbonic acid gas, or poisoned by woorari, or bled to death by opening the carotid. Here, too, soon after the blood in the umbilical vein became of a venous hue, respirations occurred as heretofore, though all manipulations were carefully avoided. It is, therefore, demonstrated that foetal respirations are excited, in the absence of external sources of irritation, so soon as the blood in the umbilical veins becomes darkened, or is cut off from the fetus.

On the other hand, in another series of cases, where the amniotic sac was exposed under a blood-warm saline fluid, and the apnoea was not disturbed, Engstrom gently pricked the extremities of the fetus with a needle. Reflex movements were excited, but the apnoea continued. When, however, deep puncture was made, the alae nasi dilated, the mouth opened, and thoracic inspiration was evoked. The effect was, however, momentary, and the apnoea returned.

Again, in order to reduce the disturbance of the placental circulation to a minimum, Engstrom, following a method invented by Preyer, seized the head of a fetus with the thumb and index-finger through the

¹ Ueber die Ursache der ersten Athembewegungen.

medulla by the increased venosity of the blood, amniotic fluid, meconium, and mucus are aspirated into the air-passages. When the compression of the cord is temporary the circulation may be restored, and the apnoea may again return; but in cases where the respirations continue, the capillaries of the lungs fill with blood from the pulmonary artery, the intrathoracic venous congestion is increased, and the heart action is lowered. As the irritability of the medulla sinks, the respirations fail, the cavities of the heart fill with venous blood, the lungs are congested, and in some instances sub-pulmonary ecchymoses result from over-distention of the pulmonary vessels. Outside the thoracic cavity, the venous trunks are often distended with blood. This secondary venous stasis is most marked in the vessels of the neck, head, and brain, but to a less degree venous stases are likewise observed in the abdominal organs and in the capillaries of the skin.

After the birth of the child the prognosis is dependent upon the degree of asphyxia. In the milder cases the muscular tonus is preserved, the head does not drop, the extremities are not relaxed, the skin is dusky-red or cyanotic, the conjunctivæ are injected, the umbilical vessels are distended, and the cardiac and umbilical pulsations are slow but forcible. Reflex movements are easily produced by surface irritation. In these cases spontaneous respiratory movements often occur.

In the more advanced stage, the muscular tonus is lost, the head falls to one side, the sphincters are relaxed, the eyes are glazed, reflex movements cannot be provoked, the heart-beats are feeble and infrequent, the umbilical vessels are nearly empty, and the pulse scarcely perceptible. The cutaneous circulation has disappeared, and the surface is pale and cold.

If respirations occur, they are feeble and are not associated with movements of the muscles of the face. The first signs of returning animation are the refilling of the cutaneous capillaries and the restoration of the muscular tonicity. In fatal cases the pulmonary vessels are found to be widely distended, the lungs are heavy and of a dark-red color, and pulmonary, subpleural, subpericardial, and subendocardial ecchymoses are present. The obstruction of the pulmonary circulation further produces congestion of the abdominal viscera and of the brain.

The indications for treatment are in all cases to clear out the air-passages, to restore the irritability of the medulla, to increase the force of the heart contractions, and to relieve the plethora of the heart and of the blood-channels of the thorax.

In cases where the muscular tonus is preserved these indications are, as a rule, easily fulfilled; aspirated fluids and mucus should be cleared from the fauces with the finger. If the nasal passages are obstructed, mouth-to-mouth insufflation should be employed. The child should be made to cry by flagellation, and the respiratory movements should be

takes place, so that a part of the blood from the inferior cava enters with that of the superior cava into the right ventricle. The contraction of the right ventricle forces the blood into the pulmonary artery, which distributes an insignificant quantity to the lungs, while the main current passes through the ductus arteriosus to the aorta, by which it is distributed to the lower portion of the body. Now, though the greater part of the regenerated placental blood is distributed to the head and upper part of the body, it is mingled largely with venous blood returning from other organs, and that which goes to the respiratory centre in the medulla oblongata is of a character which would cause dyspnoëic manifestations in self-breathing individuals.

During labor, especially in the last stage, the placental aëration of the blood is interfered with by the uterine contractions, and in its passage through the pelvis the surface of the child is subjected to pressure and friction. At birth the body is exposed to the air. These combined causes as a rule are followed by pulmonary respiration, though in some instances of lowered irritability of the medulla, prolonged apnoea follows the birth unless the child is made to cry by vigorous slapping.

As the chest expands in the act of inspiration the lungs fill with air, and the blood from the pulmonary artery pours into the opened pulmonary vessels. The pressure in all the vessels of the body is diminished, though in the thorax a partial compensation takes place from the aspiration of blood from the veins which enter the intra-thoracic space. The diminution of pressure is greatest in the pulmonary artery. The current which empties into the aorta becomes of feeble force, and finally ceases altogether. The ductus arteriosus gradually closes, and the pulmonary circuit becomes complete. The withdrawal of the blood from the pulmonary artery, and the force of aspiration, lower the tension in the aorta. The heart beats more slowly. The resulting diminished arterial pressure is most felt in the extremities. The pulsation of the umbilical arteries as a consequence ceases, and the placental circulation is suspended.

In the asphyxia of newborn infants the suspended animation is, with few exceptions, preceded by intra-uterine respirations. The causes of the latter are to be found in tetanic contractions of the uterus and the consequent diminished blood-supply to the placenta, in premature detachment of the placenta, in compression of the cord, and in the sudden death of the mother. Of these the compression of the cord is by far the most common.

The first effect of the compression of the cord is to arrest the circulation in the umbilical arteries. The pressure in the aorta is thereby augmented, and increased work is thrown upon the left ventricle of the heart. Except in cases where the mouth and nasal passages are closed by pressure, with the expansion of the chest, due to the irritation of the

streams pass through the heart cavities the systole increases in force and the arterial tension is restored.

In cases of deep asphyxia, in which muscular tonicity is lost, and the heart movements are scarcely perceptible, the methods at first employed should involve the minimum degree of disturbance to the child. Active movements are, as a rule, speedily followed by the extinction of heart pulsations.

The child should be laid upon a table and covered warmly. After clearing the fauces and nasal passages a No. 8 English elastic catheter should be passed under the guidance of the fingers of the left hand through the larynx into the trachea, and aspirated matters should be carefully removed by suction. This often requires time and the repeated introduction of the tube. Meantime, at intervals, insufflations through the tube into the bronchial tubes should be employed. After each insufflation the chest walls should be compressed with the hand to produce expiration. By this means, little by little, the blood receives oxygen, and the returning irritability of the medulla is manifested by occasional spontaneous respiratory movements. Then the Sylvester's method, which Champneys has shown is followed by the fullest expansion of the air-cells, is of service. Only, to secure favorable results it is often necessary to draw the tongue well forward. So soon as the heart movements become plainly perceptible the child should be placed in warm water, and sprinklings of cold water upon the face should be practised. Finally, the swinging method of Schultz should be employed to complete the establishment of the normal circulation.

But in these cases of deep asphyxia no miracles are to be wrought without patience, watchfulness, and a hopeful spirit. Often, when a certain amount of progress has been obtained, the heart action begins to die out, and we find ourselves obliged to go back to the catheter and insufflations anew. There is, however, no greater joy to the physician than that which comes from watching the gradual restoration to life of a young child, and to know that the life has been saved by the intelligence and the knowledge which God has given to us.

OBSTRUCTIVE DISEASE OF THE LOWER EXTREMITY OF THE ILEUM.

BY JOHN SYER BRISTOWE, M.D. LOND.; LL.D. EDIN.; F.R.S.,
SENIOR PHYSICIAN TO AND LECTURER ON MEDICINE AT ST. THOMAS'S HOSPITAL.

I HAVE entitled my paper "On Obstructive Disease of the Lower Extremity of the Ileum," for, although in their morbid anatomy, the cases I propose to narrate differed importantly among themselves, the

further stimulated by alternately immersing the child in hot and cold water. So far the procedure is a familiar one, but in a good number of cases we know that in a few days the skin becomes dusky, the heart action feeble, and the child has been temporarily restored to life only in the end to die of atelectasis. As a means of guarding against this fatal sequence, due in part to imperfect expansion of the lungs, in part to lobular congestion, there is no method that rivals the one of Schultze.

Schultze directs that the child should be grasped in such a manner that the operator's thumbs rest, on either side, upon the anterior thoracic wall, while the index-finger occupies the axilla, and the remaining fingers are placed diagonally across the back. The child is then allowed to hang at arm's length between the knees of the obstetrician, its face being turned to the front. In this position the pectoral muscles are made to draw the superior ribs upward, the abdominal muscles draw the inferior ribs downward, and the weight of the liver causes the descent of the diaphragm. By this means the capacity of the chest is increased and inspiration is produced. The child is next swung upward, until the arms of the operator reach an almost horizontal position. The swinging motion is then arrested, flexion occurs in the child's lumbar spinal region, its head is directed downward, and its lower extremities fall slowly toward the obstetrician until the whole weight of its body rests upon his thumbs. In this way the chest and abdomen are powerfully compressed, the diaphragm is forced upward, and an efficient expiration results, and any retained adventitious matters are expelled from the air-passages. An inspiration is now produced by reversing the direction of the swing and returning the child to its former position of complete extension, by which manœuvre the chest is made to expand and the diaphragm to descend.

By this method not only is good aëration of the lungs secured, but the forcible expiration expels the materials aspirated from the bronchial tubes. A still more important action, according to Schultze, is the relief of the overloaded vessels as a result of the compression of the entire thoracic contents. Thus, as expiration is produced by the upward swing the blood is pressed from the left ventricle into the aorta, and from the right auricle into the right ventricle. The emptying of the left ventricle makes room for the contents of the left auricle and permits the return current from the pulmonary veins. From the right ventricle the surplus blood finds a passage into the aorta through the ductus arteriosus. With the inspiratory swing blood is aspirated from the peripheral vessels into the blood-channels of the thorax. The aspirated blood is, however, venous, as the semilunar valves prevent regurgitation from the aorta. By alternating the expiratory and inspiratory swinging movements the pump-working of the heart is mechanically set in action. As the blood-

of bowel could be seen to rise into prominence all over its surface, to present undulatory movements, and then, with a gurgling sound, gradually to resume their quiescent state. The pain was evidently very severe while it lasted. There was an obvious tumor, roughly speaking, about the size of a hen's egg, in the centre of the right ileum, and immediately over the middle part of Poupart's ligament. It was neither hard nor dull on percussion, but was just such a tumor as might have resulted from some old inflammatory thickening about the cæcum. There was no abdominal tenderness, and in the intervals between the paroxysms, the belly, though considerably enlarged, and presenting superficial indications of dilated bowels, was soft and flaccid. There was no enlargement of liver or spleen. She was sick once or twice a day, the vomit consisting for the most part of the ordinary contents of the stomach. Her bowels were regular, sometimes indeed opened two or three times a day; the motions being somewhat fluid, of a bright yellow-ochre, and very offensive. The temperature was normal.

She remained under my care for about a fortnight, during which period her condition gradually but decidedly deteriorated; the attacks of colic and violent peristalsis (although the pain attending them was relieved to some extent by opiates) continued without abatement; she was frequently sick, and could take little or no food; her evacuations, for the first few days, were fairly regular and of the character above described; but during the last eight days the bowels were obstinately confined. The abdomen, as at first, though distended, was soft and flaccid and free from pain or tenderness in the intervals between the attacks of colic. The tumor continued without change. Her temperature was for the most part normal or subnormal.

Toward the end of the fortnight it had become obvious that unless something could be done to relieve the obstruction which obviously existed somewhere in the neighborhood of the ileo-cæcal valve, or of the lower part of the small intestine, she would speedily sink, not from the effects of actual impermeability of the bowel, but from the pain, sickness, and innutrition which were the chief symptoms of her malady. And on the afternoon of December 26th, I decided to have, as a preliminary palliative measure, the distended bowel punctured in one or two places, in order to allow of the escape of some of the accumulated gaseous contents. I did not care to do the operation myself, as at that time I was not very familiar with it; and at the moment I was unable to obtain the assistance of any one of my surgical colleagues. Just, however, as I was leaving the Hospital to keep an important appointment, I met one of the junior surgical staff, explained the case, as I understood it to him, and asked him to see it with my house-physician, and, if he agreed with me, to perform acupuncture in two or three places.

When I reached the Hospital the next day at two o'clock, I learned that my patient had died in the course of the night and that a post-mortem examination was about to be made on her. I also learned something more, namely, that the surgeon on puncturing the bowel came to the conclusion that he had punctured an abscess-cavity, and, despite the entreaties of the house-physician, had insisted on tying the trocar in, and kept it there for half an hour or more. Acute peritonitis set in even before the trocar was removed and she died of collapse in the course of a few hours.

fundamental clinical fact in each was the existence of obstruction in the situation indicated, and the symptoms which the patients presented were identical, and collectively distinctive of the mechanical character and site of this lesion. Each case, no doubt, presents some special point or points of interest which give it individuality, and to which I shall call attention; but I am afraid I must acknowledge that their general effect is not so much to teach anything actually new, as to afford a striking and impressive confirmation of facts with which most of us may be supposed to be fairly familiar. Clinically they may be considered to correspond to the cases to which Dr. Hilton Fagge, many years ago, applied the term "contraction of the small intestine."

It will be most convenient to give a brief narrative of each of my cases, making a few comments in the course or at the close of each; and to conclude with some remarks suggested by the cases collectively.

CASE I. Obstructive disease of the lower part of the ileum, due to adhesions.—Keziah P., aged seventeen years, was admitted some years ago into St. Thomas's Hospital under the care of my obstetrical colleague.

She was said to have had typhoid fever at twelve years of age; at any rate she seemed to have had at that time some serious disease, attended with abdominal symptoms which had laid her up for three months. While suffering thus, a tumor had been discovered in the lower part of the abdomen on the right side, just above Poupart's ligament. Since her convalescence from this illness she had on the whole enjoyed fairly good health, but the tumor had never disappeared, and she had been liable to attacks of colic. The tumor had not varied in size, but had sometimes been tender to pressure, and occasionally after much exertion, or maybe without any obvious cause, she had experienced aching pain in or about its situation. The colicky attacks had come on quite irregularly, sometimes pretty frequently, at other times intermitting for several weeks, usually attended with vomiting, and often lasting off and on for two or three days at a time. The bowels were said to have been regular.

During the last few months her symptoms had become more severe, the tumor had not increased in size or become more tender than it had been, but the attacks of colic had grown in frequency, the abdomen had enlarged, she had suffered much from sickness, and she had become emaciated and weak.

She was admitted into my colleague's ward in the belief, I presume, that her symptoms were due to some affection of the reproductive organs. But, in consultation with myself, this view was discarded, and on the twelfth of December she was transferred to one of my beds.

She was a bright, attractive-looking girl, but very thin and weak. She complained of severe colicky pains, coming on frequently night and day, and lasting from a few seconds to a minute or two at a time; of distention of the abdomen; of frequent sickness; and of loss of appetite. There were no indications of intra-thoracic disease, beyond some displacement of the heart and lungs upward, and some undue dulness of the lower part of the chest behind. The abdomen was much distended, and, on observing it during her paroxysms of pain, dilated coils

The case was that of a man aged forty years, who had been attacked suddenly with severe colic ten weeks before his death. In the early part of his illness such attacks occurred in bouts of two or three days' duration each, coming on at comparatively long intervals. But during the last month (for three weeks of which time he was under my care) he was suffering from almost constant abdominal pain and tenderness, associated with paroxysms of colic recurring every five or ten minutes; in which the abdomen became distended, and the inflated coils of intestine remarkably distinct. During the paroxysms the progress of the peristaltic movements could be followed with the greatest facility and there was much gurgling. He was thirsty, had no appetite, and frequently vomited stercoraceous fluid. While under observation he passed but little fecal matter, and this mainly under the influence of enemata; but there was never any proof of complete obstruction. His death was from gradual failure of his vital powers.

At the *post-mortem* examination the small intestine was found for the most part enormously distended, its color heightened, and bands of rather intense capillary congestion extending irregularly along the coils; but there was no effusion of lymph or of fluid. On tracing the small intestine from the duodenum downward, it was found in the condition above described, as far as the middle of the ileum; from which point to within a foot of the cæcum, the coils were adherent to one another and to the brim of the pelvis by congested and readily-lacerable bands and filaments of false membrane. The portions which were adherent were so entangled that it was difficult to unravel and trace them. The greater part of the involved intestine was dilated. The lower part, however, and all that intervened between it and the cæcum, were contracted to the diameter of the tip of the little finger. The cæcum and large intestine were contracted throughout. The mucous membrane was everywhere healthy. The dilated small intestine was loaded with thin, pea-soup-like fluid; but the contracted part (which, however, was quite pervious) was empty. There were a few small, solid fecal lumps in the ascending colon.

I came to the conclusion at the time that the peritoneal adhesions were the result of an attack of peritonitis occurring at the beginning of the patient's illness; and that the obstruction was due to the embarrassment to the action of the bowels resulting from the contraction of the adhesions external to them.

CASE III. *Obstructive disease of the lower part of the ileum due to cicatricial tissue.*—A. W. H., aged sixty-three years, admitted under my care on February 27, 1888. He first failed in health about twelve months previously, but it was not until last July that he began to suffer from attacks of constipation, attended with much griping pain and vomiting. The attacks of constipation, which came on irregularly, would occasionally, he said, continue for three weeks; and during their continuance he would suffer from a constant gnawing pain in the epigastrium and frequent recurrences of severe griping and vomiting. He has had eight or nine such attacks; of which the last (from which he is still suffering) came on about three weeks ago. He has been rapidly losing strength and flesh lately. He never passed blood by the bowels.

At the *post-mortem* examination there was discovered general acute peritonitis, without, however, any material effusion of fluid or of lymph. The lump detected during life in the right iliac fossa was found to be due, not to diseased cæcum or ovary, but to a kind of tangle of the lower part of the ileum caused by some old bands of lymph. This tangle began eight-and-twenty inches from the ileo-cæcal valve, and involved about fifteen inches of the bowel above. At the upper limit there was a sudden contraction of the bowel, and this was maintained not only throughout the tangle, but down to the cæcum. The intestines above were largely distended throughout, in some places measuring as much as three and a half inches in diameter. The cæcum and large intestine were of small diameter, and the sigmoid flexure, extending across the abdomen, was adherent to some extent to the mass occupying the right iliac fossa. At about eight feet from the cæcum was a perforation in the smaller bowel, nearly large enough to admit the tip of the little finger; this was surrounded for three-quarters of an inch by lymph discolored with faecal matter, which had attached its margins to the anterior abdominal wall. Further examination showed that the parietes of the dilated bowel were much thickened, especially immediately above the contracted portion; that the latter was healthy in structure and pervious throughout; that the large intestine was healthy, and that, while the distended portion of the smaller bowel contained a large quantity of thin faecal matter, there were traces of similar faecal matter in the contracted bowel and small quantities in the colon. There was nothing to show that the old peritoneal adhesions had any relation to former typhoid or any other ulceration of the bowel.

The bases of the lungs were collapsed and void of air; but the lungs in other respects, and all the other viscera, were healthy.

I assumed, during life, that the patient was suffering from some old disease of the cæcum, to which the tumor in the right iliac region was due; that such disease was the cause of the partial obstruction which had led to the dilatation and hypertrophy of the small intestine, and to its exaggerated and painful action; and that the so-called attack of typhoid fever five years previously had really been an attack of typhlitis. The lump, however, was not cæcum, but an entangled knot of bowel. It is clear she must have had localized peritonitis, probably at the time of the attack above referred to; but what the cause of this peritonitis was must remain in doubt. It seems not improbable, however, that the alleged attack of typhoid fever was really an attack of this disease, and that the peritonitis was a consequence of it. The lamentable misadventure which terminated the poor girl's life furnishes no valid argument against puncture of the bowel judiciously performed in such cases; but it proves that the operation is one likely to be attended with serious results in the absence of reasonable precautions.

CASE II. *Obstructive disease of the lower part of the ileum due to adhesions.*—A very similar case to the above was published by me about three-and-twenty years ago in the eighth volume of the *Pathological Transactions*.

a desire for food and could take it; and this was so almost to the last. The tongue was sometimes coated in the centre, but for the most part was fairly healthy-looking. The abdomen continued unduly large and tense, and was at times (especially when he was suffering from pain) somewhat tender; but there was never any indication of fluid or of tumor. The urine was usually scanty, but of normal specific gravity, and free from sugar and albumin. His pulse, which was weak, ranged from 80 to 88. His temperature was always subnormal, varying from 95° to 97.6°.

On May 25th it was remarked that, although his abdominal symptoms were not, and had not been for a few days, troublesome, he was getting very weak, and that he complained of sore throat and was husky. On the 27th I made a note to the following effect: "The patient does not suffer so much from pain as he did, he has not been sick for some days, and he takes food fairly well; but he gets thinner and weaker, his pulse is barely perceptible, and his hands, feet, and face are cold, livid, and mottled."

After this he passed into a condition of semi-stupor, in which he failed to recognize those about him, refused all food save a little wine, his pulse became imperceptible at the wrist, and his extremities very cold, his internal temperature remaining subnormal. He died a little before noon on the 29th.

Autopsy: An extremely emaciated man with slight œdema of both feet. On opening the abdominal cavity the intestines were found to be moderately distended. On further examination the large intestine throughout its whole length was found collapsed, and the small dilated down to within two inches of the ileo-cæcal valve. At this point the bowel was evidently narrowed, and cicatricial tissue was seen in its wall. On opening the intestines the larger was found to be healthy in its whole extent as also were the cæcum and its valve. But at the point in the smaller bowel above referred to, the channel was obstructed by an oval, softish mass, about as large as an almond-shell, projecting inward from one side. This projection, though having the form of a growth, occupied the convexity of a kind of kink in the course of the bowel; and, on section, appeared to consist solely of greatly hypertrophied mucous membrane, thickened muscular coat, and a comparatively large core of indurated subperitoneal tissue. No true new-growth was recognized, but it may be added that, where the kink existed, and whence the tumor appeared to spring, the two opposed surfaces of the peritoneal coat were firmly united together by old adhesions. The mucous surface of the small intestine both in the situation of the tumor and elsewhere was perfectly healthy. In the mesentery, occupying the ileo-cæcal angle, and just outside the strictured spot of bowel, a hard oval mass nearly as large as a pigeon's egg was felt. On section this presented a most unusual appearance. The middle part, comprising about a third of the whole sectional area, was a soft reddish mass; the periphery about half an inch thick, consisted of dense fibrous tissue concentrically arranged. It did not present the character of a new-growth, but it seemed probable that it was a disorganized gland which had become surrounded with a capsule of inflammatory origin.

Here and there in the peritoneum old adhesions were found, more especially between the liver and diaphragm, and the whole of the portion of mesentery in the ileo-cæcal angle was thickened and puckered.

State on admission: Much emaciated and complaining of the symptoms above detailed.

He remained in the hospital until March 12th, exactly a fortnight. During the earlier part of this time attacks of colic, attended with violent peristalsis, came on about every twenty minutes, and lasted each two or three minutes, or more. While thus suffering, the superficial coils of intestine could be seen swelling and moving as though they were a bundle of snakes, the abdomen became distended, and loud borborygmi were heard. When the attack subsided, the abdomen still remained rather full, but was comparatively flaccid and easy to explore. There was no particular tenderness; and no tumor or enlargement of any organ could be detected. He often complained of nausea, but was only sick once. The vomit did not present either sarcine or yeast fungus. The bowels were inclined to be constipated; but the motions were generally abundant, semifluid, and of a greenish hue. His urine once or twice presented a trace of albumin; his pulse varied from 60 to 70, and his temperature from 96.2° to 98.4° .

During the last week there was progressive amendment; the colicky attacks diminished in frequency and severity, although never absolutely disappearing; he lost his nausea; and his bowels became fairly regular. The abdomen, however, remained unduly tumid. His temperature continued for the most part subnormal. He did not gain strength.

Feeling better, he left at his own request.

On the 21st (that is, nine days later) he was readmitted. His bowels had not been open for five or six days; and during this period he had been suffering from frequent attacks of colic, and had had much sickness. For three or four days after admission, the bowels still remained obstinately confined, notwithstanding the employment of castor oil and other mild purgatives, and enemata. The condition of things was precisely that previously described. The attacks of colic came on every ten or fifteen minutes or so, and lasted for two or three minutes; the pain was evidently very severe; and during its continuance beads of perspiration would gather on his forehead; coils of intestine swelled up, hardened, and stood out in prominent relief; and there was much gurgling, especially toward the close of the attack. The vomiting was not specially connected with the taking of food, and was mainly of watery mucus more or less stained with bile.

He remained in the hospital for about two months, during which time he steadily got thinner and weaker, but his abdominal symptoms underwent considerable fluctuations. For the most part he suffered from looseness of bowels, the evacuations (excepting that they were semifluid) being normal in quality. Occasionally, for three or four days at a time, he was constipated. The attacks of colic varied in frequency and severity. They never absolutely left him; for periods of two or three days he would suffer comparatively little, and express himself as "doing finely"; but for the most part they were frequent and severe, and attended with all the usual accompaniments. During the time he was under observation there was no obvious relation between them and the presence of either constipation or diarrhœa. His sickness also presented variations. Not infrequently he was free from it for several days; these periods for the most part corresponding to the periods in which colic was in abeyance. Sometimes it occurred frequently; and often he complained of nausea. When fairly free from pain and sickness he had

attack is attended with the swelling-up of coils of bowel, generally first observable in the right iliac fossa, but gradually extending over other parts of the abdomen. The convolutions become distinctly mapped out, sink and swell and vary in size and tenseness, until at the end of from twenty to thirty seconds a loud gurgling takes place, apparently in the neighborhood of the umbilicus, the distention subsides and the parts become quiet. During the attack the patient suffers from severe pain, but is almost quite free from tenderness. In the intervals the abdomen, though large and prominent, is flaccid, and admits of ready examination. There is no enlargement of liver or spleen, and no tumor excepting a hard, smooth, painless lump, deeply seated in the right hypochondrium just below the tips of the ninth and tenth ribs. This was described by the house-physician as extending, at the time of admission, for a distance of two inches below the ribs, but I never myself found it extending more than a finger's breadth in this direction, or measuring more than an inch and a half horizontally. No further evidence of disease is detectable, either in the abdomen or in the chest. Tongue clean. There is a red line along the margins of the gums, but no blue discoloration. Urine free from albumin and sugar. Temperature normal.

For twelve days after admission the patient's condition underwent no material change. The abdominal pains and peristaltic movements of the bowels continued to come on every few minutes, although both were kept to some extent in abeyance by opium. The abdomen was generally tense but not markedly tender. The lump which had been recognized on admission remained without obvious change. His appetite was poor and he was occasionally sick. The bowels acted irregularly but sufficiently. The temperature remained subnormal.

On July 5th it was noted for the first time that the abdominal cavity contained fluid. This increased during the next few days and the belly became very tense and somewhat tender. The colicky pains and movements continued, and the latter were still strikingly obvious through the parietes. His tongue got coated; his appetite disappeared; he was still sick from time to time. The bowels became much constipated, and indeed, from about July 5th onward there was no satisfactory action. Yet they were occasionally relieved slightly by enemata or castor oil, and he continued to pass flatus. There was still no rise of temperature. About July 7th a patch of anæsthesia appeared on the front of the right thigh, in the domain of the middle cutaneous nerve, associated with some neuralgic pain, which phenomenon continued.

On the twelfth he was extremely weak and ill. The abdomen was very tense and tender and contained a good deal of fluid. The colicky attacks continued, though they were hardly so severe as they had been. He was scarcely sick, but did not take food. His temperature was still subnormal. He passed flatus but there had been no evacuation for two days. It may be added here that the evacuations had never presented any blood and were for the most part half-formed.

As the bowels were extremely tense it was determined to puncture them to let off some of the flatus. This was done in the afternoon, but only a little gas escaped and no benefit resulted. He died at 10 p. m.

Autopsy: Body much wasted; no *rigor mortis*. The abdomen fairly large but extraordinarily tense. On making an opening into it, turbid yellow fluid spurted to a height of about three feet, clearing the table.

All the other abdominal organs were healthy; as also were the nerve-centres. Both lungs were intensely congested in their dependent parts, and dotted with islands of recent broncho-pneumonia. The aortic and mitral valves were thickened, but there was no serious cardiac disease.

The resemblance of this case to that of Keziah P. was in its symptoms so striking that while the patient was still alive I could scarcely avoid regarding it as of the same nature, and I leaned to the belief that (even though no definite lump could be felt) there was an obstruction at the lower end of the ileum, and that that obstruction was due to the entanglement of the bowel by old adhesions. There was old inflammatory mischief, and also there were adhesions; but the obstruction, as has been shown, was due, not to the latter, but to a narrowing of the lower end of the ileum effected partly by the presence of a kind of cicatrix occupying one side of the gut, and partly by a projecting lump caused apparently by thickening of the intestinal walls at that part. Again, the cause of this condition remains doubtful; and there was nothing in the patient's history, as it was elicited from him, to afford a hint toward the solution of the problem. I must confess I am inclined to suspect, in this case as in the other, that the phenomena present were really the sequelæ of a former (and forgotten) attack of typhoid fever. The curious lump discovered in the mesentery in the neighborhood of the obstruction seems to be best explained on the assumption that it was a disorganized gland which had become encapsuled. If such were the case, it enhances the probability of the typhoid fever hypothesis being the true one.

The clinical phenomena of the latter part of the patient's illness point, I conceive, to death, not from obstruction directly, but from innutrition and asthenia.

CASE IV. *Obstruction of lower end of ileum due to malignant disease of the ileo-cæcal valve.*—William R., a plumber's mate, eighteen years of age, was received into one of my wards on the 23d of June, 1890. He had had good health down to the commencement of his present illness, and had been a plumber's mate for three years.

Early in May he had an attack of colicky pain which, starting from the right groin, radiated over the abdomen. After lasting two or three minutes it passed away, only to recur thenceforth at irregular intervals. Diarrhœa accompanied the onset of the pain and lasted three or four days; since when the bowels have been quite regular. A week or two after the beginning of his illness he began to observe that the attacks of pain were attended with swelling of the abdomen, and subsided with a gurgling sound. He has had no sickness or loss of appetite, and has not observed any blood or anything else abnormal in his motions. The bowels have latterly been open two or three times a day. He thinks he has lost flesh.

He is anæmic and emaciated, and complains of paroxysmal attacks of abdominal pain coming on at intervals of ten minutes or so. Each

CASE V. *Obstruction of lower part of ileum due to malignant disease.*—John H. C., a clerk, aged twenty years, a patient of Dr. James Barbour, was admitted under the care of Mr. Sydney Jones on the 21st of July of the present year, and on the 31st was transferred to mine.

His health had been good down to the previous November, when he was first attacked with severe pain in the umbilical region coming on after taking food. From that time until February the attacks seem to have occurred daily, supervening on every meal, and lasting for an hour or so. In February the quality of the pain altered. It assumed more of a "tearing" character, commencing in the right iliac fossa and thence radiating over the abdomen, and was attended with flatulent distention. Attacks of this kind have continued ever since, coming on irregularly; sometimes in severe paroxysms, sometimes for a week or two together in a mild and bearable form. About the end of March his medical attendant discovered a lump in the cæcal region, which the patient lost after lying up for five or six weeks. In April he became sick; and for the six weeks prior to admission he has suffered from sickness, mainly in the morning, and occurring about once a week on the average. His bowels have been inclined to constipation all along, but have been kept free by the use of enemata. He has gradually failed in strength, and has lost forty-two pounds in weight during the last eight or nine months.

State on admission: Patient is anæmic and emaciated, complaining of pain after food with habitual constipation, and frequent attacks of flatulent colic, followed occasionally by sickness. The abdomen is somewhat resistant and distended. At intervals varying from five to ten minutes, he experiences a sharp pain in the right iliac fossa, accompanied by sudden distention of the bowel in that situation, and subsequently by distention of various coils of small intestine. So dilated do they become that the abdominal wall, moulded to them, reveals by its inequalities and movements the varying state of the parts beneath with remarkable distinctness. This condition having been maintained for about twenty seconds, there follows a loud gurgling sound, with the cessation of which the abdomen becomes quiescent. There is a little pain on pressure and some sense of resistance, but no definite tumor, in the right iliac fossa. No tumor or enlarged organ can be felt anywhere else; and there is no indication of the presence of fluid effusion. The solid organs of the abdomen and the thoracic viscera all appear to be healthy. The urine has a specific gravity of 1022, is acid, and free from albumin. Tongue clean; appetite poor; bowels confined; pulse 80; temperature normal.

On August 5th he was examined under chloroform, and a lump about the size of a tangerine orange was felt deep-seated in the right iliac fossa.

On the 12th, an exploratory operation was performed by Mr. Pitts. The abdominal cavity was opened in the right linea semilunaris. A little clear fluid escaped through the wound; and numerous adhesions between the bowel and adjoining parts were discovered, some of which had to be broken down. The cæcum was fixed and could not be brought into view; but a hard new-growth was felt, apparently involving the wall of this viscus and of the lower part of the small intestine for several inches. It appeared also to extend downward into the upper part of the pelvis. Several of the mesenteric glands were enlarged; and a mass of similarly-enlarged glands occupied the retro-peritoneal tissue. In addition, many small white bodies, the size of rape-seed, studded the peri-

In this way perhaps two or three pints were discharged. On laying the abdomen open, nothing but much distended small intestine was visible, everywhere brightly injected, but showing no evidence of past or present inflammation. On exploring the cavity, a large, hard mass was at once felt in the upper part of the right loin, but was not visible. It lay under cover of the liver and on the anterior surface of the right kidney. On further examination, the mass, which was as large as a man's fist, was found to be due to a growth (originating in the situation of the ileo-cæcal valve, but involving both the ileum and the cæcal walls in the immediate neighborhood), which had passed by intussusception into the ascending colon for a distance of about six inches. The intussusception could not be reduced. The tumor was annular in form, with a narrow channel of about two inches in length, and allowing the passage of the little finger in its axis. Its surface was purple and congested. On section it was hard and white. The portions of the bowel involved in the intussusception were not materially congested. The small intestine, as above stated, was extremely distended, containing some flatus and a large quantity of bright yellow pasty feces. It was free from ulceration or other disease.

There were numerous enlarged glands in the mesentery and in front of the vertebral column, up to the size of a pigeon's egg. They were very soft and pinkish-white on section. The morbid growths were small round-celled sarcoma.

Of the three punctures made shortly before death all were visible in the abdominal walls; but only one was discovered in the intestine as a minute scratch without any extravasation.

All other organs were healthy.

The symptoms in this case again were so similar to those of the cases that had gone before, that I was compelled to the conclusion that, in it as in them, there was some obstruction in the smaller bowel near the cæcum; and, knowing how common a cause of obstruction adhesions in this situation are, I concluded that there were adhesions. Adhesions, however, are very frequently connected with the presence of peritoneal cancer or tubercle; and the discovery of a lump, apparently having some relation with the liver or the peritoneum in its vicinity, tended to confirm the suspicion that the boy was suffering from one of these affections. The coming on of ascites later, as I thought, settled the question. I acknowledge I never had any suspicion that he was also the subject of intussusception, or that the small lump I recognized during life was the lower end of a much larger mass tucked up under the liver. But I may add that, while I admit that an ileo-cæcal intussusception might, and often does, produce symptoms identical with those exhibited by my cases, I think, as a matter of fact, the intussusception in this instance had no influence over the patient's symptoms or the progress of his case.

The question as to whether the patient's symptoms were due to lead-poisoning was raised several times. I did not acquiesce in that view; nevertheless, for a short time he was treated with iodide of potassium; but, needless to say, without benefit.

of insuperable constipation with its usual accompaniments; he may, of course, have attacks of colic and of visible peristaltic movement, but these for the most part follow on complete obstruction, and even then are rarely, if ever, so continuous or so violent as they were in my cases. It is admitted that the larger bowel is, as a rule, less readily excited to violent peristaltic action than the smaller bowel; and in disease of the colon, the lesser bowel usually takes but little active part in this process, owing doubtless to the fact that the ileo-cæcal valve readily allows fluid or semi-fluid matters from above to be transmitted into even a distended colon, while it prevents any regurgitation, and the small intestine consequently is protected to a large extent from the direct influence of the stoppage below.

In diseases of the cæcum, at any rate in typhlitis and in malignant disease involving the wall of this viscus, there are of course local pain and tumor, but there is not generally at any time absolute stoppage; and although, no doubt, in some cases the smaller bowel becomes after a time excited to undue peristaltic action, it must be very seldom if ever that one meets with such persistent and violent peristalsis as my cases exhibited. I have met in the last few years with three cases of fatal cancer of the cæcum; but in none of them was there serious obstruction, and in none were attacks of colic noted.

Diseases of the small intestine attended with complete obstruction are always, so far as I know, acute, and, as a matter of fact, are either intussusception, strangulation, incarceration, volvulus, or the impaction of a large gall-stone. I need scarcely say that in all these cases the symptoms come on suddenly, the cases are of acute progress, and violent peristaltic movements of the bowel are either very slight or conspicuous by their absence.

My cases all fall clinically, as I have already stated, into the category of cases which Dr. Hilton Fagge termed "contraction of the small intestine," and which correspond to the strictures of the large intestine. That is, they are cases of chronic obstructive disease of the smaller bowel; but they are cases in which the patient dies, not from the superintention of complete stoppage which usually brings these latter cases to an almost sudden close, but from the gradual influence of the impediment over the bowel above and the gradual induction of innutrition and asthenia. One main reason for the different termination of these two varieties of obstruction is that in the larger bowel the feces tend to solidify and become difficult of passage through a narrow orifice, while the contents of the small bowel remain, as a rule, semifluid or pulpy and transmissible to some extent to the last. It is obvious that the combination and progress of symptoms in such cases as I have brought forward are determined less by the nature of the disease present than by its seat. As I have shown, the clinical phenomena in all my cases

toncal surface. It was clear that there was disseminated malignant disease of the intestines and peritoneum, and the operation, therefore, was abandoned.

The patient suffered no serious inconvenience from the operation, and the wound soon healed. He is still under treatment, and remains in much the same state as on admission. He has apparently lost flesh somewhat and become weaker; but otherwise there is no marked impairment in his health. A tumor can still be felt, but it has not obviously increased in size. He remains liable to attacks of flatulent colic, which vary in severity, frequency, and duration; are sometimes, even for days together, so slight as to be of little trouble to him, sometimes for hours or days at a time very intense. He still suffers from nausea, and occasionally from sickness; but often has a fair appetite. His bowels vary; are occasionally a little constipated; but, on the whole, partly under the influence of enemata, partly of their own initiative, act regularly and freely, sometimes two or three times a day. The evacuations are mostly semi-fluid, and once or twice of late have been accompanied by a little discharge of red blood, but are otherwise normal in quality. The abdomen remains full and more or less tense, and usually free from tenderness; but handling it, or exposing it to the air, generally brings on attacks of colic. The urine is free from sugar and albumin. His temperature has occasionally risen to 100° , but has remained almost continuously normal or subnormal.

I have no particular remarks to make on this case, excepting that the presence of a tumor which had been observed off and on for some time, and the progress of events, led to the belief that this patient, like the last, was suffering from abdominal malignant disease; and that, although an operation was not looked upon at all hopefully, it was (considering the invariably unfavorable issue of all my other similar cases) thought desirable to afford him even this shadow of a chance of relief.

It will be admitted, I think, that in their main clinical features each of the foregoing cases was so much a counterpart of every other, that it was only natural that, as case after case came under observation, the family likeness they presented among themselves should be noted, and that they should stand out in my mind as a characteristic group. The points in which specially they resembled one another were: the frequent attacks of painful colic associated with visible and violent peristaltic action of the smaller bowel, the absence of anything like complete intestinal obstruction, their chronic progress, and their invariably fatal tendency.

The cases with which (looking at them after the event) one would be disposed to compare them are cases of obstructive disease of the colon, cases of disease of the cæcum, and cases of acute obstruction of the smaller bowel. But the differences between those several affections and my own cases are for the most part obvious. In obstructive disease of the colon, the patient may, of course, have had premonitory symptoms lasting over many months, but death is generally due to the coming on

could have been successfully performed. In neither of the other three (I mean the ease of narrowing of the lower end of the ileum, and the two cases of malignant disease) do I think an operation would have been of the slightest benefit; indeed, in the last it had to be abandoned. At the same time I am free to confess that, looking to the unamenableity of these cases to medical treatment, to their almost certainly fatal outlook, to the possibility that some such cases may really be due to lesions capable of successful surgical treatment, and to the fact that abdominal section is now a comparatively simple and safe procedure, I should be disposed in most cases, if not to urge, at any rate to sanction, the performance of an exploratory operation.

THE TREATMENT OF DERMATITIS HERPETIFORMIS.¹

BY LOUIS A. DUHRING, M.D.,

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IN the several communications on this disease that have been published by me during the past five years, no special remarks have been made concerning its treatment. The subject-matter of these papers has been largely confined to a statement of the cases observed with the view of setting forth the symptoms and the more important clinical facts, in the hope that the disease might become better known. A number of cases (perhaps ten or twelve) have been reported by me, and others have been observed in my private and public practice, so that now it seems appropriate that something be said about the treatment of this exceedingly rebellious disease. At the same time, I would state here that in many cases the remedies employed, both external and internal, seemed to exert but little or no beneficial effect. In severe cases, and especially during an exacerbation, no form of local treatment used appeared capable of making a favorable impression on the skin. In such instances the disease is the most difficult to influence of all the inflammatory affections, surpassing even inveterate eczema.

The internal treatment may first receive attention. The generally-recognized observation that the disease may arise from and be dependent upon several distinct or even diverse causes, precisely, for example, as occurs in the case of eczema, precludes positive statements as to remedies. Each group of cases, based on the etiological factors at work, requires special handling, and hence I believe no class of remedies can be recommended which would be suitable to all cases. The origin of the disease,

¹ Read before the American Dermatological Association, September 3, 1890.

were as nearly as possible the same; and yet in two the obstruction was due to adhesions compressing and embarrassing the bowel; in one it seemed to be referable to a kind of stricture produced by some localized inflammatory condition in the intestinal wall, and in two it was caused by malignant disease—in one certainly involving the ileo-cæcal valve and the ileum in its neighborhood, in the other almost certainly affecting identically the same parts. I may add that I have met with more than one case of chronic intussusception in adults implicating the ileo-cæcal valve, in which the symptoms were in great measure the same; and that disseminated tubercles or cancer of the peritoneum, associated with adhesive inflammation, may, of course, have the same effect on the bowels as adhesions resulting from simple inflammation. It may be asked why the three cases of cancer of the cæcum, to which I have referred above, differed so much in symptoms from the two cases narrated at length. The important difference is this: that in the former cases the walls of the cæcum were the special seat of disease, and there was no real obstruction; whereas in the only one of the latter two cases which has terminated fatally the disease originated in the situation of the valve, and caused marked obstruction at this point, which was of course equivalent to obstruction of the lower end of the ileum itself.

I have said little as to treatment; and I have to acknowledge that I have very little to say. My patients were treated mainly with opium, either given by the mouth or administered subcutaneously, which I need scarcely say was of immense service in relieving pain and in restraining the violent movements of the bowels. As a general rule, the bowels acted pretty freely of themselves, but occasionally, when constipation had existed for a few days, and the excessive peristaltic action was in abeyance, a small dose of castor oil seemed serviceable and enemata afforded some relief.

Next as regards operative measures. My attempts to relieve by puncturing the bowels were not successful, and I am not sure that I shall try it again in such cases. For even though the bowels are distended and resonant on percussion, there is no doubt (I think), judging from the history of the cases, as well as from post-mortem evidence, that the chief distention is due to the accumulation of thin faecal matter; and this suggests a possible source of danger. At any rate, the punctures, as a matter of fact, gave exit to very little gas, and afforded no relief. The most important question, however, is, Should an exploratory operation be performed? I am bound to say, looking back upon my cases, that I do not think an operation would have been of real benefit in any of them. It is extremely difficult, even at a post-mortem examination, to cope successfully with old adhesions causing very considerable matting together of bowel. Such difficulties must be greatly enhanced during life. I do not myself think that in either of my first two cases such a dissection

that have been employed. These are: Tar, in the form of oil, ointment, and alcoholic and alkaline tarry lotions; carbolic acid, sulphur, Vlem-ingckx's solution of sulphurated lime, thymol, ichthyol, hydronaphthol, resorcin, and fluid extract of *grindelia robusta*. On account of the peculiarity of the eruption, including its multiformity, mixed acute, subacute, and chronic stages, and distressing subjective symptoms, it is difficult both for the patient and physician to estimate the value of any remedy. Such sufferers, moreover, are seldom content to remain long under the care of any one physician, hoping continually to derive benefit from frequent change of treatment. Of the remedies just referred to, the most valuable is sulphur, and in the form of ointment, about two drachms to the ounce. I was first led to employ it through the statement of a patient many years ago, who had derived more benefit from it than from any other substance. He had suffered long with the vesicular variety, and had sought the advice of many physicians without obtaining even temporary relief. On one occasion, in desperation, he rubbed himself vigorously with a strong sulphur ointment, made soft by the addition of walnut oil. This afforded immediate and gratifying relief, such as no other application had ever given, and, moreover, soon caused the eruption to disappear. On subsequent occasions he had again employed it, and he regarded it as the most valued remedy known to him. The remedy and mode of application seemed to me harsh and unlikely to succeed, but a trial proved satisfactory and bore out the statement made. My experience with it leads me to regard it as especially useful in the vesicular and pustular varieties, and also in the bullous, but that in the erythematous variety it usually proves irritating. Let me here say, however, that in some cases it has failed to act favorably, and I by no means wish to lay too much stress on its value, nor to put it forth as a specific. I merely desire to state that in the vesicular variety it is the best remedy that we are acquainted with. It should be applied with friction and with sufficient force to break down the vesicles, pustules, and blebs as speedily as possible. As already intimated, the ointment should be strong, about two drachms to the ounce, and should be used in the manner indicated, with the view of making a positive impression on the skin, by causing, as it were, local shock to the nerve-endings. The rubbing should be long continued and thorough. It is useless merely to smear it on, as the object by this means is not accomplished. In suitable cases acceptable relief to the itching and burning is usually obtained after one or two applications. Remedies of this class, I believe, are the kind from which most benefit is to be looked for. They should not be too harsh nor too stimulating in their action. The strength and the amount of friction must be regulated by the effect. They should be applied as early in the attack as possible, as soon as the lesions begin to form.

where this is ascertainable, should ever be kept in mind, and the treatment be pursued in this direction on general principles. With a disease which in most instances is exceedingly persistent and chronic in its course, a speedy cure is not to be looked for, either from internal or local remedies.

I shall make my remarks as practical as possible and be brief. The local treatment may first be considered. It must be remembered that the disease, as a rule, is multiform in character, and that, as in the case of eczema, we have to deal with varied lesions, at one time erythema, at another vesiculation or pustulation. The several varieties of the disease, therefore, naturally call for different formulæ, certainly as to strength, and sometimes even for different remedies. Thus, my experience has shown that milder preparations are required for the erythematous than for either the vesicular or bullous, and I would here remark that this (erythematous) variety is the most difficult of all to control by local means, while the vesicular is the most easily influenced. It is not my purpose at present to take up the treatment of the several varieties of the disease specially, but rather to ask attention to the principles of treatment applicable to the disease as a whole. From a therapeutic standpoint the affection may be considered under the headings of acute, subacute, and chronic, the two latter stages being those we are generally called upon to treat. It must be kept in mind that the disease involves in most cases the greater part of the general surface; that therefore there is a good deal of cutaneous surface requiring attention, and that the remedies must be selected and prepared to meet that end. Another difficulty that we have to contend with is that the eruption tends to repeat itself in the form of more or less frequently recurring outbreaks or crops, a new one often coming out before the old one has disappeared, the skin thus being in a peculiar state, interfering with and complicating the treatment. It is this condition and the variety of elementary and secondary lesions generally present at the same time that render the treatment so difficult. Almost all the cases that have been under my observation have been chronic, and previously had undergone all manner of treatment; in some instances at the hands of competent dermatologists. Long experience has taught me that the disease is most difficult to control, and that some of the remedies from which good results might be looked for—such, for example, as are useful in eczema—exert but little or no influence in arresting the process. The milder so-called soothing preparations, as boric acid, calamine and oxide of zinc lotions, ointments, and pastes, sometimes so useful in acute or subacute erythematous and vesicular eczema, are of no value in this disease. I have long since arrived at the conclusion that the only class of remedies from which benefit is to be expected is stimulants, especially those which act revulsively. I will first enumerate a few of the more important substances

remedies. Among such drugs I would first speak of arsenic, which in suitable cases offers, I believe, more hope of benefit than any other remedy. By suitable cases I mean more particularly the simple, uncomplicated chronic cases, whose history and cause are obscure, and not those manifestly due to a deranged uterus and the like. At the same time, from my experience and from that of some other practitioners with whom I have been in communication on the subject, it must, on the whole, be regarded as disappointing. No reliance can be placed upon it, and sometimes it seems rather to aggravate the disease. Upon inquiry I have found that most of the patients who have been under my observation had at one time or another previously taken a course of arsenic, and without experiencing much, if any, benefit therefrom. I may add that it has often been a matter of surprise to me how little influence, for good or for bad, it possessed over the disease. While, therefore, some cases seem to have been benefited, the majority have not been so, possibly, in some instances, because the drug had not been administered in sufficiently large doses. In one case, however, very large doses of Fowler's solution (as much as forty or fifty minims a day) were tolerated, and seemed for the time being partially to control the bleb-formation, but the results, upon the whole, were not beneficial. I believe it to be well worth a trial in the vesicular and bullous varieties, and the dose should be gradually increased. From the well-known power of arsenic to relieve and to cure some cases of true pemphigus, one would naturally look for good results in suitable cases of the disease under consideration, which is, without doubt, allied to the pemphigus process. As far as our knowledge of the treatment of dermatitis herpetiformis extends to-day, no other remedy offers so much hope of benefit in suitable cases, and the results, whether beneficial or harmful, should be duly chronicled with the reports of future cases. Of the value of quinine and strychnine, there is not much to be said beyond that they do not appear to possess any special power over the disease. The same remark may be made concerning certain other general remedies that have been employed—as, for example, iron, cod-liver oil, and ergot. In several cases that are called to mind, it was thought that the hygienic influences of change of air and scene might prove beneficial by giving tone to the nervous system, but in this the results were not commensurate with the trouble incurred. But I would by no means undervalue both moral and hygienic treatment, both of which should receive full consideration, for experience with this disease shows that in most cases general physical and mental depression are conspicuous features.

In some cases tar, especially in the form of the alkaline solution known as liquor picis alkalini, is useful, especially in allaying the itching. It is, of course, to be diluted, one drachm to about eight ounces of water, according to the caustic effect produced. Another equally valuable tarry solution, and one that is safer to use, is that known as liquor carbonis detergens, an alcoholic solution of coal-tar. This also is to be similarly diluted, though sometimes it may be advantageously used strong, one drachm to from one to four ounces of water. Both of these preparations are useful in relieving itching, but I do not think that they exert much influence in arresting or modifying the progress of the eruption, and hence they can hardly be looked upon as curative. In the erythematous variety they prove of most value, because here the friction ointments are usually not tolerated. Ichthyol I have used in varied strength, in the form of ointments and lotions, and, as in the case of tar, the latter have proved more serviceable, but the remedy is not so efficient as tar. Nor can I speak favorably of resorcin, thymol, and carbolic acid. The last-named remedy, especially, has proved less useful than one would expect, considering its well-known powers in other allied inflammatory states of the skin. Of the various remedies and combinations which have been employed on various occasions none can be specially recommended, and hence they need not be enumerated. Baths, for the most part simple and hot, have been used with some benefit in relieving the burning and itching. A patient exhibiting the erythemato-vesicular variety, recently under my care, regarded a hot bath of an hour's duration at night as grateful, but he did not seem to sleep better than when it was omitted. The same patient had, during a previous severe attack, endured a fortnight's experience with the continuous bath, which had afforded a certain amount of ease and comfort, but had not proved in any degree curative.

Concerning the internal treatment not much that is favorable can at present be said. With a disease tending to pursue an emphatically chronic course, speedy cure is hardly to be expected. This observation is borne out by experience. Several cases under my notice some years ago recovered in a short time under, for the most part, internal treatment, but I am not prepared to state that the cure was due to the remedies used. In the relapsing and obstinate form, relief is to be obtained, I believe, only from such remedies as favorably impress the nervous system. The cutaneous symptoms are such as point distinctly to the neurotic nature of the disease. The eruption, as a whole, possesses features in common with the well-known and established neurotic inflammatory diseases, such as herpes simplex, herpes zoster, herpes iris, and pemphigus. The nervous system, it may be centrally or peripherally, is undoubtedly in some manner and in a variable degree deranged, and it is to aid this important function that we must look in the choice of

this time urination was more frequent than normal. Five years ago, he had an attack of acute cystitis, accompanied by much pain; and from that attack the bladder never wholly recovered, giving him at times much trouble, but never, until the present illness, compelling him to stop work.

In the middle of June, 1889, when feeling quite well, he had a sudden stoppage of water. For this he saw a doctor, who passed an instrument into the bladder, with some relief of his symptoms; and, shortly after, he passed a small phosphatic stone. He had severe pain for a week, and this continued, though somewhat less in degree, up to the time that he was seen by the writer, on August 2, 1889. The pain was felt just before, during, and after passing water, and lasted for about a minute after the act of urination was finished. Occasionally a few drops of blood came in the last part of the stream. The urine was loaded with mucus and pus, and contained many pavement epithelial cells, both singly and in clumps; it was usually colored somewhat by the presence of blood; it passed in a fairly good stream.

An examination with a sound at this time did not find a stone, but showed a slight narrowing in the deep urethra, at the site of the old operation. There being but little improvement under treatment, he was sent to the Massachusetts General Hospital for a more thorough investigation under ether.

In this examination the sound failed to touch a stone or any calcareous matter, but, after the exploration, a washing with the Bigelow evacuator brought away several small papillomatous-looking masses. These bits were examined by Dr. W. F. Whitney, who reported that they were composed of papillary masses of epithelial cells mixed with lime salts; and, though they did not have the branched forms common in papillary growths in the bladder, it seemed probable that they came from a papillomatous tumor.

It was, therefore, decided to do a suprapubic cystotomy to remove the growth; and this operation was done on September 5, 1889. The Garson-Peterson method was followed. The bladder held seven ounces of boracic solution, and the rectal bag was distended with about fourteen ounces.

On opening the bladder, the posterior wall was seen to be of a whitish-yellow color, and to the finger it felt stiff, and was rough on the surface. The rest of the bladder-wall was normal in appearance. It was presently found that a thick membrane could be detached from the diseased surface, and, with care, could be peeled off with the fingers in sheets of one or two square inches area. It was loosely attached, and after removal left a smooth surface, which bled but slightly. The wall of the bladder which it left felt soft and supple.

This membrane having been removed as thoroughly as possible, the bladder was drained by a double rubber tube carried to the bottom of the cavity, and an antiseptic dressing was applied.

The operation was followed by very little fever or discomfort, and the wound did uninterruptedly well. On the fourth day one tube was removed and a catheter was tied in through the urethra. On the ninth day the remaining tube was taken out, and the wound rapidly closed; so that, on the eighteenth day, the catheter was finally left out, and the patient passed water by natural efforts.

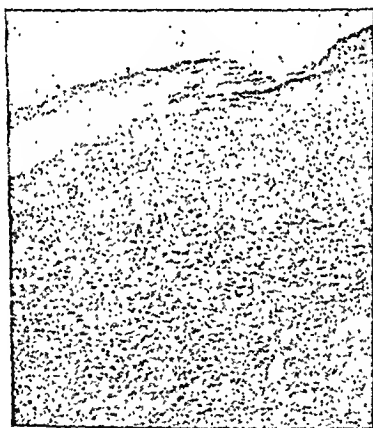
Urination was now quite frequent, and the urine showed a large trace of albumin and contained considerableropy pus with an admixture of blood. This condition of the urine improved quite rapidly under the

A CASE OF CYSTITIS, WITH THE FORMATION OF A THICK
EPIDERMAL SHEET IN THE BLADDER—
PACHYDERMIA VESICÆ.

BY A. T. CABOT, A.M., M.D.,
OF BOSTON.

THE following case was reported before the American Association of Andrology and Syphilology, at their fourth annual meeting, in the hope that some member of the Association could put the writer on the track of the report of similar cases. None of those present had seen or known of such cases, except Dr. J. A. Fordyce, of New York. He brought to the meeting photo-micrographs obtained from sections of the bladder and ureter of a patient that he had seen on the autopsy table in Vienna, but of which he could give no clinical history. The condition shown in these photographs was exactly similar to that found in the case which forms the text for this paper, and one of them has been accordingly reproduced here (see Fig. 1).

FIG. 1.



Photogravure reproduction from a photo-micrograph of a dermoid sheet in the ureter. The sheet of epithelium lies on the connective tissue below with papillæ running up into it. Some exfoliation is shown on the surface. (From Dr. Fordyce.)

Dr. Fordyce also called the writer's attention to an article by Posner in Virchow's *Archiv*, upon "Dermoid Changes in Mucous Membranes," and it is to this article and other German investigations referred to by Posner, that this paper is indebted for the pathological consideration of the subject.

The following is the clinical history of the case:

The patient, James E. B., was a strong-looking man aged forty years. In 1870 he was cut for stone by the lateral perineal method. The wound healed in about three weeks, leaving no fistulous track. Always after

layers of epithelial cells, which in the deep parts are more or less rounded, and on the surface are flattened. Krause and Oberdieck¹ describe four layers of epithelium; and the latter has determined the thickness of the epithelial portion of the mucous membrane to vary between 0.036 and 0.068 millimetre in the empty bladder, and to be about one-half to one-third as thick in the full bladder.

FIG. 2.



Cross section of membrane.

The epithelial layer forms a flat sheet on the connective tissue beneath, and has no papillary arrangement such as exists in the deep layers of the skin.

The membrane in the case reported, which was made up entirely of epithelium, was therefore from fifty to one hundred times as thick as the epithelial layer normally existing on the bladder-wall, and its nourishment was provided for by papillæ thrown up by the connective tissue below.

These papillæ are entirely unusual in this locality, yet they nowhere showed any tendency to go beyond limits of growth that are physiological in other parts of the body. There was at no point any formation of extremely long, branched papillæ, such as are seen in papillary growths of the bladder. In short, the condition resembled the hyperplasiæ that are met, not uncommonly, on other epithelial surfaces as the result of

¹ Ueber Epithel u. Drusen der Harnblase, etc. Göttingen, 1884.

daily injection of a solution of nitrate of silver, one grain to three ounces, and, at the same time, the capacity of the bladder steadily increased.

The patient finally left the hospital on October 31st, at which time he could hold his water for from one and a half to two hours, the bladder having a capacity of about four ounces. There was still quite a large amount of sediment in the water, which consisted chiefly of mucus, but which for some days had begun to contain a number of epithelial flakes similar to those noticed before the operation.

After leaving the hospital, he continued the bladder irrigation, using a boracic solution twice a day; and every second day, in addition to this, he injected the bladder with a solution of nitrate of silver, two grains to the ounce, taking care afterward that this wholly escaped.

Under this treatment, supplemented by the occasional passage of sounds to keep the deep urethra properly dilated, he slowly improved, gaining both in power of holding water and in general condition. During the winter he took turpentine for a time, which cleared the urine somewhat; and, later, under the moderate use of sandal oil, the improvement was still more marked.

In May, 1890, he was finally able to resume hard work. He then weighed as much as he ever did. The urine still contained considerable sediment, but it was of a light flocculent character and there was no appearance of blood. There were whitish clumps of epithelium in it, but these were lighter in texture and not so large as the solid white masses that it formerly contained.

A thorough rectal examination was made at this time, but nothing abnormal could be detected about the posterior bladder-wall.

In August, 1890, he continued well, and the urine no longer contained any of the epithelial flakes or clumps. It was still somewhat cloudy from a slight admixture of mucus.

The membrane removed at the operation covered an area of about forty-five square centimetres, and when fresh was from two to three millimetres in thickness, varying within these limits in different parts.

Fig. 2 shows very well the microscopical appearance of a cross-section of this membrane. It is composed of epithelial cells, which are arranged much as they are on the surface of the skin.

In the deeper parts they are penetrated by papillæ of connective tissue, and the cells are square or rounded, while, as the free surface is approached, the cells become flattened like ordinary epidermal cells, and on the surface they are being exfoliated in ragged flakes. In places, near the surface, there are well-marked onion bodies, or epidermal pearls; but at no part are these to be found in the lower layers of the epithelium.

There is, in the lower part of the horny epithelium, a well-defined stratum of cells containing kerato-hyalin—which is a proof, if any were needed, that these are true dermoid cells.

At no place is there any apparent tendency of the epithelial elements to burrow down into the connective tissue beneath, after the manner of a cancer.

The mucous membrane of the bladder is normally covered by several

is to be remembered, however, that the anterior portion of the urethra—*i. e.*, all of the canal anterior to the constrictor urethræ muscle—is of ectodermal origin, being formed by an infolding of the outer epithelial layer, so that only when dermoid changes are found in the deep urethra can they be regarded as occurring on mucous membranes of entodermal origin.

When we come to the bladder we find instances of dermoid changes extremely few and doubtful. V. Antal has reported a case of epithelioma of the bladder in which all the histological characteristics of the outer skin were observed. Even the kerato-hyalin layer was there. Posner justly says, however, that great care is necessary in such cases, to be sure that the tumor is primary on the mucous membrane. He also quotes a case of Marchand's¹ to show to what extent the epithelium of the skin may grow over onto the mucous membrane of the bladder. In this case, a boy with a perineal fistula following lithotomy, had the bladder, the ureters, and the pelves and calices of the kidneys covered with a lining of horny epithelium which had grown in from the skin.

These are the only instances that Posner has been able to find of epidermal changes of the mucous membrane of the bladder. He considers neither of them as clear examples of a change (*Umwandlung*) of the vesical mucosa into epidermis, but rather as instances of transplantation or of direct growth of epidermis onto the bladder by continuity of tissue.

Whether the case presented with this paper can be accepted as an undoubted instance of the bladder mucous membrane undergoing an epidermal change must be decided by the consensus of opinion of those best able to judge.

The fact that the patient had a lithotomy many years before, introduces the doubt whether here we have not a case of the growth of the epidermis of the skin over on to the mucosa of the bladder. It is to be remembered, however, that the perineal wound was open for only three weeks, that it then healed solidly and smoothly, and that there is now no dipping in of the skin, such as is seen in cases of old fistulæ.

It seems to the writer that this rapidity of healing precluded the possibility of any continuity of growth of epithelium between the skin and bladder, such as occurred in Marchand's case.

Furthermore, the clinical history of this case seems to throw some light on the etiology of the affection. After the operation the clumps of epithelium exfoliated from the dermoid surface reappeared in the urine, persisted, though in diminishing amount, for more than six months, and only finally disappeared after about ten months. This would seem to show that the dermoid condition continued over portions of the

¹ Naturforscher Versammlung zu Wiesbaden.

long-acting irritations. On the skin we have corns and callouses, due to a pathological process almost exactly identical. There is, however, this difference, that whereas in the skin we have a simple hypertrophy of the horny layer which is normally present on that surface, we here have the formation of a highly-developed horny layer on a surface on which true epidermal cells do not normally exist.

Virchow¹ has described a similar condition of the mucous membrane of the larynx, which he has named "pachydermia laryngis." He has shown that, when the mucous membrane of the larynx is exposed to persistent irritation, the epithelium may become much thickened into many layers and cornified, while papillæ are thrown up out of the connective tissue below. This change he noticed only on those parts of the larynx where the epithelium is of the pavement variety. And he regards those parts of the laryngeal mucous membrane which normally have pavement epithelium, as allied to the outer skin, and, therefore, subject to changes and pathological processes such as are met with on the skin, while the portions of the larynx which are covered with ciliated epithelium—*i. e.*, the more properly mucous surfaces—he thinks, are not subject to these changes.

Posner² points out, however, that the kind of cell on a given surface is not a reliable guide in determining the relation of that surface to others which seem to resemble or to be allied to it. Thus the nasal cavities, which are infoldings of the ektodermal layer, and are, therefore, allied to the outer skin, are covered with ciliated epithelium and are plentifully supplied with mucous glands—in short, are covered by a true mucous membrane.

Posner, therefore, divides the question of the cornification of mucous membrane into two parts: (1) Can mucous surfaces covered with cylindrical cells undergo dermoid changes? And (2) Can surfaces of a meso- or ento-dermal origin take on a dermoid character?

The first of these questions he answers easily in the affirmative, and brings forward in proof many observations showing the change of cylindrical epithelium into dermoid cells.

The second question is, however, the one that particularly interests us in connection with our cases; for the bladder, being derived in the embryo from the sinus urogenitalis, is distinctly of entodermal origin, and has no close relationship, therefore, with the external skin.

In the consideration of this question Posner points out the frequent occurrence of the dermoid change on the mucous membrane of the upper portion of the vagina in cases of prolapse. Similar changes are also observed in the uterus, in the larynx, and in the male urethra. It

¹ Berl. klin. Wochenschrift, August, 1887.

² Virchow's Archiv, vol. cxviii., 1889.

tions of salicylic acid solution. He said that he had had excellent results from the use of these solutions in the treatment of cystitis, and he thought they would be peculiarly applicable in cases of this sort, for salicylic acid has the well-known power to remove warts, corns, and other growths of hyperplastic epithelium.

If milder methods of treatment fail, and resort to operation seems indicated, the suprapubic section affords the only satisfactory method of dealing with the membrane; for its separation and removal by the limited route through the perineum are manifestly impossible.

THE TREATMENT OF ARTERIO-VEINUS ANEURISM, WITH TWO CASES TREATED BY EXTIRPATION.¹

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CASE I.—John S., twenty-eight years of age, single, a factory-hand, born in the United States, was admitted to my service at St. Luke's Hospital, December 20, 1889. The patient's family history was good, and he had always enjoyed good health. Four years before he had contracted syphilis, but it had never affected him seriously. Thirteen years before, he was shot in the right leg with a pistol ball of .22 calibre, entering (from the left side) near Hunter's canal, and remaining in the tissues. The leg swelled at once after the injury, and he could not walk for two months, but he never felt any pain. One year later he first noticed a pulsation in the popliteal space, and thinks that he discovered a thrill at the same time, but the limb occasioned him no trouble, and he worked and walked as usual. One year ago the veins in the leg became greatly swollen, œdema of the leg and foot appeared, and ulcers formed on the leg, which caused him great pain. His condition gradually grew worse, and last week the pain kept him awake at night.

Examination: The right lower extremity is much increased in size, and six inches above the patella it measures $19\frac{1}{2}$ inches in circumference as against $15\frac{1}{2}$ inches in the left; and below the tuberosity of the tibia the right leg measures $15\frac{1}{4}$ inches in circumference, while the left measures only $11\frac{1}{2}$ inches. The veins of the entire extremity are distended and very numerous, and strong pulsation can be seen in the superficial veins about the knee and over the thigh—except on its inner and upper surface. Below the knee there is no pulsation in the veins. The venous distention and pulsation are most marked on the outer side of the thigh, even as high as the great trochanter. When the soft parts of the thigh are pressed between the hands a strong expansive pulsation is felt. The skin of the leg is of a dark bronze color, thickened and scaly, and there is an ulcer one-half of an inch in diameter, and of chronic appearance, situated on each side of the leg near its middle.

¹ Read before the New York Clinical Society, April 28, 1890; second case reported December 26, 1890.

bladder-wall, and was finally so modified by treatment that all evidences of it vanished.

The nitrate of silver injections were not of a strength to destroy epidermal tissues, and no other part of the treatment could be supposed to have any power to effect the destruction of this membrane.

All of the treatment was directed against the cystitis, and the disappearance of the dermoid flakes coincidently with the mitigation of the inflammation in the bladder would suggest that the dermoid condition was induced by the irritation of the cystitis, and disappeared *pari passu* with the cessation of this irritation.

Virehow has shown that *pachydermia laryngis* has resulted from not unsimilar irritations of the mucous membrane of the larynx, and the writer is inclined to the view that in his case the dermoid change in the bladder was a result of the chronic cystitis.

In making a diagnosis of this condition in future cases the points to be taken into consideration are the chronic character and obstinacy of the cystitis, and the presence in the urine of flakes and clumps of horny epithelial cells.

It seems quite possible that a *pachydermia vesicæ* exists not infrequently in a less degree than in the case reported and goes unrecognized. The appearance in the urine of considerable numbers of flakes of epithelium is not uncommon in the course of severe cystitis, and that the dermoid condition should not be recognized on the autopsy table may well be due to the maceration which the epithelium rapidly undergoes after death. This is so great that in order to obtain correct ideas of the condition of the epithelium in a normal bladder it has been necessary to inject the bladder immediately after death with absolute alcohol to fix the cells and prevent their separation. The present more frequent performance of suprapubic cystotomy will probably give us opportunities to recognize this dermoid change during life.

With the cystoscope the whitish color of the surface might perhaps be appreciated, and in places where the edge of the membrane was sharply defined, characteristic pictures might be obtained. It would probably, however, be very difficult to distinguish this condition from some of the yellow surfaces furnished by tuberculous ulcerations of the bladder.

As far as we can judge from this one case, the treatment of a similar condition should be directed to the allaying of the inflammation. Certainly the injections of nitrate of silver seemed to answer an excellent purpose. And every measure that allayed the irritation and enabled the patient to carry his water longer and to urinate with less pain was followed by a corresponding diminution in the amount of pus in the water and in the number of epithelial flakes.

Dr. J. P. Bryson, of St. Louis, suggested the possible utility of injec-

nize any peripheral pulse in spite of frequent and careful examination. Pressure upon the femoral artery below Poupart's ligament, or at the apex of Scarpa's triangle, stopped the pulsation and thrill in the popliteal tumor, and at the same time the tumor above Poupart's ligament grew smaller and lost its pulsation. Very forcible pressure was necessary to control the pulsation of the vessels in any part of their course. The strongest pulsation, thrill, and murmur were observed to be situated on the outer side of the popliteal space—not over Hunter's canal.

The patient was kept in bed for a fortnight, during which the extremity grew much smaller and the ulcers healed. A distinct tumor could then be recognized in the upper and inner part of the popliteal space, toward Hunter's canal, about the size of a hen's egg. The heart-sounds were normal and the apex-beat lay three and a half inches to the left of the median line and external to the nipple.

Operation, January 20, 1890. The patient was etherized and Esmarch's bandage was applied to the thigh, after a rubber bandage had been fastened around the leg below the knee (to form a reservoir of blood to facilitate dissection), and leaving also the blood in the sac and its neighborhood. All of the very numerous vessels crossing the incision were divided between double ligatures. Drawing the nerve to the inner side, we reached the tumor, which filled the entire popliteal space, and was found to consist of the popliteal vein, immensely distended, and forming a sac three and a half inches long and one and a quarter inches in diameter, the distended part passing quite suddenly at each end into the vein of normal size. The sac was not adherent anywhere, and it was easily enucleated from the surrounding tissues, there being but one small branch given off from the vein (on its anterior aspect) in the whole length of the distended portion, until the upper angle of the popliteal space was reached. At this point the communication between the artery and vein was found, and such a sheaf of branches was given off from the latter that it was necessary to enlarge the incision upward for three inches (a total of seven inches) before the true relations of the parts could be ascertained. It was finally made out that the artery and vein were connected by a short passage, about a quarter of an inch long and of about the same diameter, with walls of the thickness of the arterial walls, about half an inch below the ring in the adductors, and that, directly opposite the opening in the vein, six or seven branches sprang from the latter by a common trunk, the combined area of their openings being fully equal to the calibre of the vein itself. This short venous axis was directed outward, and this fact explained at once why the pulsation and thrill had always been so strong under the outer hamstring. Besides these vessels, there were others given off from the external and anterior surfaces of the vein, and a large vessel arose from the short channel of communication between the artery and vein, passing downward and appearing to be one of the muscular arterial branches. The dissection was made very difficult by the tangled mass of veins, but finally they were all secured. The artery was ligated above and below the point of communication, and about half an inch of it was cut away, including this point. A small branch of the artery just below also required ligation. The vein was secured above and below the dilated part, and the latter excised. The Esmarch constrictor was removed, and so thoroughly had even the smaller vessels been secured, that only two or three more ligatures were required. The

There is a faint scar at the point where the patient says that the bullet entered—near Hunter's canal.

There is a general expansile pulsation visible in the popliteal space, and the skin here is œdematous, but no well-defined tumor can be made out. A very strong pulsation can be seen and felt along the femoral vessels, and extending over Poupart's ligament, where a pulsating tumor can be felt over the external iliac vessels, about the size of a hen's egg. It is impossible to distinguish between the pulsation of the artery and that of the vein. There is a very strong thrill to be felt over the popliteal space, and this thrill is conducted upward along the femoral vessels into the tumor above Poupart's ligament, and it is also to be felt in the superficial veins of the thigh, but not in those below the knee. This thrill is continuous, but its intensity varies with the arterial pulse, being most marked at the apex of the pulse-wave. Corresponding to the thrill a loud, rough murmur can be heard over the same area by bringing the ear into contact with the leg, but not at a distance; the murmur is also continuous, its intensity varying with the pulse-wave,



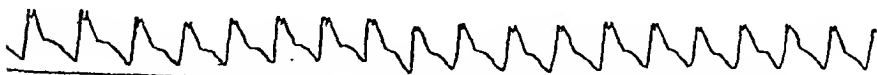
John S. Right radial; pressure $3\frac{1}{4}$ ounces. January 18, 1890.



Over tumor in popliteal space; pressure $2\frac{1}{2}$ ounces.



Over tumor on inner aspect of thigh; pressure 3 ounces.

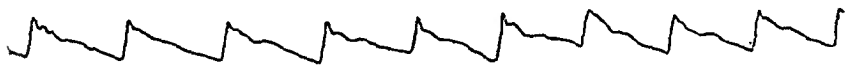


Femoral, 6 inches below Poupart's ligament; pressure $3\frac{1}{4}$ ounces.

and has all the characteristics of the murmur heard in arterio-venous aneurism. One of the surgeons who examined the patient thought that he could detect pulsation and thrill in the anterior tibial artery, and perhaps on that occasion some unusually favorable position of the limb rendered this possible, but none of the other surgeons were able to recog-

but kept his bed until the wound healed. The tumor gradually diminished in size, and in a few weeks he was working as usual. Five years ago, he injured the skin over the right tibia, and since that time has had a succession of ulcers, which, although of small size, were very painful. He has a feeling of numbness and coldness in the right foot, and that limb is more easily fatigued than the other.

Examination of the limb shows an ovoid tumor between the internal condyle and the hamstring of that side, projecting one inch above the level of the limb, and measuring five inches vertically and two and a half transversely. This tumor pulsates strongly and expansively, and the skin over it is traversed with distended veins, which, however, do not pulsate. There is also a diffuse pulsating swelling in the popliteal space, more prominent externally, where the hamstring tendons appear to be flattened out over it. At the most prominent part of the first tumor, just above and behind the epicondyle, is a scar, where, the patient says, the ball entered; and in a corresponding position on the outer side of the knee is a slightly larger scar, which, he says, is the wound of exit. An enlarged artery is felt passing down along the anterior border of the first tumor and on the inner side of the patella, and along the outer



Left radial; 3 ounces. November 26, 1890.



Over tumor, outer part of popliteal space; 3 ounces.



From pulsating vein near saphenous opening.

border of that bone is a similar vessel. The anterior and posterior tibial arteries cannot be felt. The veins of the leg and thigh are distended, but there is no pulsation in them, except in one large vein, which appears under the skin at the back of the middle of the thigh and turns around its inner border to empty into the deeper veins at the saphenous opening, and the pulsation in this vein is increased by pressure upon it just before it reaches that point, showing that it receives the pulsation distally. Over the tumor can be felt a very strong arterio-venous thrill, most distinct near the wound of exit, and the same thrill is felt in the pulsating vein just described, and at the saphenous opening, where it is nearly as strong as at the wound of exit. The thrill is not conducted into the

artery was of normal size, and its walls of normal thickness, so far as it was exposed in the wound, while the veins were all enlarged and their walls much thicker than natural. A drainage-tube was inserted and the wound closed with catgut sutures. When the dressing was completed, a very faint capillary circulation was found to be present in the toes, as was shown by the return of color when the blood was pressed out of them. The circulation improved daily, and became natural by the fourth day, and on that day the sensation in the foot, which had previously been rather blunted, appeared to be normal.

About two weeks after the operation, when the wound had healed, and after the patient had been sitting up for a day or so, about a drachm of pus was discharged from the upper angle of the wound, apparently coming from a considerable depth.



John S. Femoral, 5 inches below Poupart's ligament. February 25, 1890.

February 26th, the patient was discharged. The right thigh then measured 18 inches in circumference at the groin, 15 inches at the junction of the middle and lower thirds, and $14\frac{5}{8}$ inches above the patella. The right leg measured $12\frac{1}{2}$ inches in circumference below the knee, and at the junction of the upper and middle thirds $11\frac{1}{2}$ inches. There was no pulsation to be felt in the popliteal space. A large artery courses down upon and external to the outer hamstring, very superficially, and the anastomotica magna can also be felt quite distinctly. Pulsation in the femoral and external iliac arteries is more forcible than natural, but less so than before the operation. There is still something of a tumor above Poupart's ligament, but it is much smaller and does not pulsate so forcibly. (In the following May, the condition of affairs was about the same.)

CASE II.—William McC., twenty-four years of age, single, born in New Orleans, a laborer by occupation, was admitted to St. Luke's Hospital, suffering from a crush of three fingers of his left hand, October 30, 1890. He has always enjoyed good health, and denies syphilis. About nine years ago, he was shot in the right knee, with a pistol, the ball of which entered on the inner side and emerged from the outer. A very large



Wm. McC. Right femoral at Poupart's ligament. November 3, 1890.

pulsating tumor appeared at the point of injury (as large as the head of a young child, according to the patient's account), and he felt a strong thrill which extended up into his body. He had no surgical treatment,

in the wound, and about an inch of each was removed in the neighborhood of their communication with the sac. The vessels lay side by side at their point of communication with the sac, and probably opened into it on their internal and anterior aspect by a common orifice. The specimen was injured at this point in the dissection, and it was impossible to ascertain their exact relationship. There were no other vessels opening into the sac. All vessels had been tied in the wound as they were divided, and only a few points required ligature after the removal of the Esmarch. The wound was closed by a continuous catgut suture, a gap being left in the middle of the popliteal space for drainage, and a small tent of iodoform-gauze was inserted into it. A pad of iodoform-gauze was placed next the wound and bichloride dressings applied. The entire foot and limb were wrapped in cotton. Even immediately after the operation was concluded, the circulation in the toes was fairly good, the blood returning quite promptly when pressed out by the finger, and the next day it was normal. The operation lasted two and one-half hours.



Femoral in Scarpa's triangle; 4 ounces. December 31, 1890.

The sac resembled the inverted human heart in shape, and measured when distended three and one-half inches from base to apex, three inches across its broadest part, and two and one-half inches in thickness from before backward. Its walls were formed of laminated cellular tissue and its shape also showed its origin as a diffuse (traumatic) varicose aneurism. The sac was partly filled with firm clot on the side opposite to its communication with the vessels. The vein was of normal size, the artery being also normal above, but contracted to about two-thirds of its natural diameter immediately below the point of communication with the sac.

The wound healed by primary union, except in its central portion, where the displaced tendon of the semi-tendinosus made some pressure. The patient feels well, and his ulcer has healed, but it is too early to say whether it is permanently cured.

William Hunter and Guattani first recognized the aneurisms connected with both arteries and veins, and explained their pathology, but we owe the name arterio-venous aneurism to Virchow. The division of these aneurisms into varicose aneurism (a sac connected both with an artery and with a vein) and aneurismal varix (in which a direct passage exists between the two, without the formation of a sac) originated with Scarpa. These subdivisions answer for the classification of most cases, but it is necessary to recognize an intermediate form in which the artery communicates directly with the vein, and there is no separate sac, but in which the vein is so greatly distended at the point of communication as to form a sac—a variety of which my first case is an example, and which has been especially described by the French authors.

tissues surrounding the aneurism, but is felt along the great vessels of the thigh, although not so distinct as at the saphenous opening. A very loud and rough arterio-venous murmur is heard over the aneurism and wherever the thrill can be felt, and it is also transmitted through the tissues of the entire limb, being heard with the stethoscope in the sole of the foot. Pressure upon the femoral, anywhere from Poupart's ligament to Hunter's canal, will stop the pulsation, thrill, and murmur, and the artery can be compressed without the use of very great force. The right leg does not differ from the left in size, condition of skin, or hair, but it bears a very tender ulcer, about an inch and a half in diameter, in the midst of a scarred and pigmented area. There is no œdema, and the veins are not greatly distended.

The patient was kept in bed for some time, until the ulcer had practically healed, and he had recovered from the injury to his hand, and during this time the pulsation, thrill, and murmur diminished very noticeably. December 8th, it was noticed that there was no thrill in the tumor which projected between the condyle and hamstring on the inner side of the knee, and that it had also disappeared from the dilated vein described as emptying into the saphenous opening. Very slight pulsation was occasionally observed in a vein in front of the internal malleolus. No thrill could be detected in the vessels immediately above Poupart's ligament, in spite of the distinct thrill and loud murmur at the saphenous opening, and this circumstance, together with the fact that both were so much more distinct at that point than along the great vessels in the thigh, make it probable that they were intensified there by the cross current from the superficial distended vein, and were not conducted along the femoral vessels. The murmur was also less marked over the internal part of the tumor than in the popliteal portion.

Operation, December 11, 1890. Ether anæsthesia. Rubber bandage around the calf to secure a reservoir of blood below the wound to aid in dissection if necessary. Esmarch bandage applied to the thigh, leaving the sac free from compression. An incision seven or eight inches long was made over the popliteal space in the median line of the limb, extending up to the middle of the thigh. When the fascia had been divided, the entire popliteal space was found filled with the sac of the aneurism, and this was separated from the surrounding parts with a little difficulty, for it was somewhat adherent. The popliteal nerve was not seen during the operation. Some large vessels communicating with the sac were found on its outer aspect, lying quite superficially, and were divided between double ligatures. The lower end of the sac was then turned out of its bed and found to be divided into three lobes by deep grooves, the central lobe lying between the heads of the gastrocnemii. The internal lobe lay to the inner side and in front of the inner hamstring, which had formed the sulcus between it and the middle lobe. The external lobe lay under the outer hamstring, which was expanded over it, and was divided from the middle lobe by a groove formed partly by the tendons, partly by the vessels as they twisted around the sac. The entire sac was then readily dissected out, and it was found that the vessels already tied off were the popliteal artery and vein, which lay on the outer side of the sac, passing spirally around it, from their exit from Hunter's canal above and in front of the sac, to the middle of the popliteal space below and behind it. The remains of the vessels were sought

cose by perforation of a vein. In two other cases the temporal artery was involved, and, although we cannot assume the presence of atheroma, for one patient was only eighteen years of age, the liability of this vessel to form cirroid aneurisms may account for the change. The fourth case was Dupuytren's, occurring in the thigh of a young man who was wounded six months previously, at the site of the aneurism, in Hunter's canal—and it is totally inexplicable. The opinion that the artery is usually contracted below, appears to have been formed from the fact that the peripheral pulse was weaker than normal, but this is an unreliable sign, for the pressure of the tumor might cause a diminution of the pulse-wave, even when the artery retained its normal calibre. The mere loss of blood by leakage into the vein may cause a weakness of the peripheral pulse, as is very beautifully proven by the case of Müller (*Archiv. f. klin. Chir.*, xv., 1873), in which a soldier was wounded in the left arm, near the axilla, by a rifle-ball, and an aneurismal varix formed without a tumor, but with great distention of the superficial veins. Six months after the injury, the radial pulse could not be felt unless pressure was made so as to prevent the flow of blood from the artery into the vein, when, with the cessation of pulsation in the veins, the radial pulse became distinct, only to disappear again on removal of the pressure. Eighteen months later the condition remained the same, showing that an artery can remain of normal calibre for years, even if its usual blood-supply is very much reduced, and also that absence of the peripheral pulse does not prove diminution of the calibre of the vessel at that point.

As the artery dilates, its walls are apt to grow thin, and some would ascribe the thinning of the arterial wall to the diminished blood-pressure, but it is by no means certain that the arterial pressure is less than normal, and in some cases it is apparently greater—certainly an increased force of pulsation of the artery is a very frequent symptom. The sphygmographic evidence, which might throw light upon this point, is not yet extensive, but so far as it goes it favors the idea of an increased blood-pressure in the artery. Dr. Keen has published a tracing from the radial artery in a case of arterio-venous aneurism of the flexure of the elbow, before and after the operation, and it shows a much more forcible beat on the diseased side before the operation, the difference between the two sides disappearing almost entirely after the operation. Richet also found a similar difference between the two radials in a case of arterio-venous aneurism of the bend of the elbow, in which the tracing was made by the celebrated Marey himself—but unfortunately no tracing was made after the operation. These cases, then, indicate a rise in blood-pressure in the artery beyond the aneurism, and imply that the obstruction to venous return of the blood may project itself into the artery through the capillary system even although the

Although these aneurisms belong anatomically to the class of aneurismal varix, they are clinically similar to varicose aneurisms, having the same tendency to growth and liability to rupture.

When a communication has been established between an artery and a vein, the walls of both vessels undergo certain changes, and their calibre alters, and these changes are of great importance in considering the safety of applying a ligature to the artery, and to the vein as well. The older writers undoubtedly exaggerated the extent and frequency of these changes. The veins, as a rule, are distended, although not always, and their walls become thickened. According to the majority of authors, the calibre of the artery above the site of the communication becomes enlarged, but Bramann expressly states that the artery generally remains normal unless endarteritis is present. As no one else appears to have analyzed the reports of so large a number of cases as this writer, I have carefully sought the original records of his cases as far as they were accessible, accepting his own summary when they were not, and have analyzed thus 81 cases in which an operation or an autopsy allowed the vessels to be examined. The condition of the artery is noted in 33 cases, in 19 of which the calibre of the vessel was enlarged above the communication with the vein, and in four others both above and below. In 10 cases it is expressly stated that the vessel was not enlarged above, in 5 of which it is also said to have been healthy below. In 7 cases, moreover, in which the artery was enlarged centrally, it was not enlarged peripherally. The presence of endarteritis is mentioned in only two of the cases. In 3 cases it is stated that the artery was contracted beyond the aneurism. It would appear from this showing that Bramann is incorrect in his assertion, and that the commonly-accepted opinion that the artery is frequently dilated above the aneurism is much nearer the truth. On the other hand, in reading the reports of recent operations, I have been much struck by the fact that the artery was found to be normal in so many cases, as it certainly was in my first case. In my second the artery was normal above, but contracted below. Perhaps this difference is due to the fact that the operation is now performed before the changes have progressed as far as they were formerly allowed to go. The cause of this enlargement of the artery is unknown, and as we do not even know as yet whether the blood-pressure at this point is increased or diminished, we must wait for more knowledge before a satisfactory theory can be framed.

As to the condition of the artery beyond the aneurism, the figures already given show that it is generally normal, but that it may sometimes be contracted, even when it is dilated above. But there are four exceptional cases in which there was a general enlargement of the peripheral artery and its branches. One of these we can explain by general atheroma, as the aneurism was originally arterial, becoming vari-

above the aneurism, they differ so much that we need more material before any definite conclusions can be drawn from them.

The symptoms and diagnosis of arterio-venous aneurism require but slight notice here. The signs which are spoken of by most authors as invariably present, and which are certainly pathognomonic when they are found, are the thrill and murmur. But the thrill is sometimes absent, and the murmur may be of the ordinary arterial bruit type, so that such careful observers as Czerny and Annandale thought that they had to deal with arterial aneurisms until the true nature of their cases became evident during the operation. No particular cause was discovered which would account for the absence of these important symptoms in their cases. Perhaps the sphygmograph may help us in the future. If it were proposed to apply the Hunterian ligature in such a case, on the supposition that the aneurism was of the arterial form, the mistake would be a very serious one, for this method of treatment is a very dangerous one in arterio-venous aneurism.

TREATMENT.—Arterio-venous aneurisms have proven peculiarly recalcitrant to the simpler means of treatment, and, owing to their relatively good prognosis, surgeons have dreaded to undertake the more serious operations by which alone they could be cured. But if the records of these operations are examined, it becomes evident that the principal dangers incurred are such as have been greatly diminished by the advances of modern surgery. The older surgeons were certainly justified in thinking that the evils of this condition were seldom sufficient to justify exposing the patient to the dangers of primary and secondary hemorrhage, gangrene and pyæmia, which operations at that time implied; but the Esmarch bandage and the artery-clamp render hemorrhage easily controllable during the operation, and with the improvement of the materials for ligatures and the freedom from septic complications in the after-course of the wounds, ligature of large veins without bad consequences is a matter of daily occurrence, and secondary hemorrhage and sepsis have become rarities, so that the views of modern times have changed very considerably, and operations have become more frequent.

Compression.—Compression has failed, as a rule, in these aneurisms, except in cases which were treated very early and in which superficial vessels were involved. Pressure has generally succeeded only when applied so as to occlude the opening between the artery and vein while it was also exerted on the artery above. In some cases the aneurism was converted into the arterial form and then completely cured by the Hunterian ligature. Among 26 cases of reported cures by compression collected by Bramann, 20 were in the brachial, 2 carotid, and 3 femoral. (Note that his lists give a total of 63 cases of brachial arterio-venous aneurisms, and 46 femoral and popliteal cases.)

latter does not show any signs of it. The evidence of these cases is not weakened by such cases as that of Müller already quoted, in which the radial pulse was lost on the diseased side, for the seeming contradiction can undoubtedly be explained by differences in the size or position of the communication between the vessels, or in some other mechanical conditions.

There is also evidence of increased pressure in the artery *above* the aneurism in some cases. Ebenau's tracings in Czerny's case (*Berlin. klin. Wochenschr.*, 1883, 19) of a small aneurism in Hunter's canal, taken (it was supposed) over the femoral vein, probably give a combination curve of both artery and vein. It is a very remarkable curve, with a broad apex indicating a high blood-pressure. In my cases, Dr. Joseph A. Blake and Dr. L. F. Warner, house-surgeons of the hospital, made tracings with Dudgeon's sphygmograph from the popliteal tumor itself, from a dilated vein, and from the femoral vessels; it was impossible to distinguish between the artery and the vein. As no peripheral pulse could be felt, no tracings could be made beyond the aneurisms. All the tracings are very similar, showing an arterial curve of high tension with a broad apex—in the first case made up of two sharp points. In tracings made after the operation, these peculiarities are absent. One might be tempted to explain the double apex as due to pulsation in the vein immediately following that in the artery, but as the same characteristic is found in the tracing made over the tumor, I think we must attribute it to a vibration of the lever of the instrument on an unusually broad apex, due perhaps to the very forcible pulsation of the vessels.



Case of Dr. R. F. Weir. Femoral above the aneurism.

Dr. Robert F. Weir has kindly given me permission to show a tracing made in an unpublished case of his by Dr. Ellsworth Elliot, Jr., also with Dudgeon's instrument. The aneurism was a small sac connected with the anastomotica magna artery and vein, and the tracing was made over the femoral vessels above the tumor.¹ The curve is similar to that in my cases. It is interesting to compare the curve over the sac in my cases with that obtained by Bramann in v. Bergmann's case of axillary aneurismal varix, the latter being a purely arterial curve. On the whole, although the tracings indicate increased tension in the artery

¹ A lad of fourteen years, who had wounded himself with a sharp iron rod four weeks before. Extirpation. Cure. Sac nearly one inch in diameter.

while Norris (AMERICAN JOURNAL OF THE MEDICAL SCIENCES, 1847, xiii. p. 13) found 11 cases of gangrene in 95 of ligature of the external iliac. These facts have completely condemned the operation for use in the extremities, and the high mortality of the operations in the neck condemns it there also. The greatest care should therefore be taken to exclude the possible existence of an arterio-venous aneurism, when it is proposed to perform the Hunterian operation in any case of aneurism of the extremities. The explanation for the frequent occurrence of gangrene in these cases given by Stromeyer (*Handbuch der Chirurgie*, 1844) is undoubtedly the correct one, namely, that when the collateral circulation is established and the blood finds its way past the ligature into the artery beyond, it flows directly into the vein through the communication with that vessel, instead of passing on to the peripheral circulation. Therefore, an accidental inclusion of the vein with the artery in the ligature would actually be a favorable occurrence.

Double ligature of the artery.—The double ligature of the artery above and below the point of communication, treating the latter as a simple wound of the vessel, and without attacking the sac itself, has given fairly good results. Of 15 cases we find 9 cured, 2 relapsed, 1 recovered after amputation for gangrene, and 3 died. Of the deaths all were in pre-antiseptic times, 1 was due to gangrene, 1 to secondary hemorrhage, and 1 to amputation on account of secondary hemorrhage. We shall return to the question of gangrene later. Two cases relapsed—Norris's, situated upon the brachial, and Davies-Colley's, upon the femoral in Scarpa's triangle. In the first case the relapse was due to an arterial branch given off from the sac, which fed it after the ligature was applied; and in the second it is supposed to have been due to the premature softening of the catgut ligature. The cause in Norris's case illustrates the strongest objection to the method, and among the cases of this disease examined by operation or post-mortem will be found many which have the same anatomical arrangement, making a cure by this method an impossibility; for instance, those of Brainard, Ollier, Venturoli, v. Wahl, and myself. As bearing upon this point we may also quote the case of Galozzi (Bramann, Case 127), who tied the external iliac without improvement, and some days later tied the femoral in Scarpa's triangle below the sac, also without effect—the number of branches given off in this location readily explains the bad result. We may also note Stimson's case (AMERICAN JOURNAL OF THE MEDICAL SCIENCES, 1884, lxxxvii. 325, and *N. Y. Med. Journ.*, 1888, i. 214, 555) of aneurismal varix between the common carotid near its bifurcation with the internal jugular vein, in which he tied the common carotid with temporary improvement, and four years later secured both the external and internal carotids beyond the point of communication between the artery and the vein without lasting result, the intermediate

The methods of galvanism and of injection of coagulating substances into the sac are totally inadmissible in these cases, although there have been a few instances of cure by these means, for the danger of embolism is very great on account of the direct communication between the sac and the vein, and I am surprised to find that so good an authority as Holmes still admits them to a place among methods worthy of trial.

Hunterian ligature.—The results of the single ligature applied above the lesion,¹ generally after the Hunterian method, for this form of aneurism, have been very bad. Van Buren collected 24 cases, and adding to them the cases in Bramann's list, which were so treated, and a few from other sources, I find the following results:

CASES OF HUNTERIAN LIGATURE FOR ARTERIO-VEINOUS ANEURISM.

VESSEL.	Gangrene occurred.	RECOVERED.			Died.	Total cases.
		Cured.	Improved.	Unimproved.		
Common carotid . . . . .	...	...	2	1	4	7
Subclavian . . . . .	...	...	...	...	2	2
Brachial	2	4	...	0	6	19
Common iliac	1	...	...	...	2	2
Internal iliac (gluteal) . .	...	1	...	...	...	1
External iliac	4	...	...	2	5	7
Common femoral	2	1 (amputated)		...	1	2
Femoral superficial	2	1	...	6	3	10
Anterior tibial . . . . .	...	1	...	...	...	1
Totals	11	8	2	18	23	51

According to this table, we have only 8 cures in 51 cases, including 1 case saved by amputation after gangrene set in. We will not consider the mortality as shown by this table, for in order to collect a sufficient number of cases it was necessary to use very old ones, and the most frequent causes of death were sepsis and secondary hemorrhage, and will only note that the operation failed to cure one-third of the cases. But I wish to draw attention to the great frequency of gangrene as compared with the same operation performed for arterial aneurism. That both cases of ligature of the common femoral caused gangrene is not surprising, but note that there were 2 cases of gangrene in 19 ligatures of the brachial, 2 in 10 of the superficial femoral, and 4 in 7 of the external iliac. Gangrene after ligature of the brachial is an exceedingly rare accident, and in 77 cases of ligature of the femoral for popliteal aneurism Holmes (*System of Surgery*) found only 3 cases of gangrene,

¹ Of course the single distal ligature has never been applied to these aneurisms.

lital case. Of the 11 cured, 2 were temporal, 6 brachial, 2 popliteal, and 1 tibial. It should be noted that all but 4 of these 17 cases were operated upon prior to 1870.

Extirpation.—An equally reliable method is that of extirpation of the aneurismal sac, of which I have the records of 20 cases. There is only one death in this series, which was due to sepsis, although it was operated upon by a capable surgeon in 1878, affording an illustration that accidents will sometimes occur in the course of wound-healing even in modern days. Relapses were impossible, consequently all of the remaining 19 cases have been cured. The cases are thus distributed: temporal 4, radial (fatal) 1, brachial 3, axillary 1, articular artery of the knee 1, anastomotica magna 1, femoral 6, and popliteal 3.

Results.—To gain a proper idea of these operations upon the sac, or upon the vessels near the point of communication, we must group them together, for the differences between them as to danger to life and limb may be considered about equal, since, although the extirpation of the sac may require more time than incision, this appears to have produced no effect upon the mortality, the only death in the 20 cases of extirpation having been due to sepsis, and not to the prolonged operation. Moreover, the accidental fact that most of the cases of extirpation were performed since 1870, while those of incision were performed before that date, gives the former almost no mortality, and the latter a death-rate of nearly 33 per cent. We have, then, a total of 60 cases treated by these various operations, with 47 cures, 2 relapses (both in operations upon the artery alone), 2 limbs lost by amputation, and 9 deaths. All but one of the cases in which life or limb was lost were operated upon before 1870, and in all but two sepsis was the cause of the accident. In these two gangrene occurred, and this brings us to a question which has been left until now for our study.

In 21 operations upon the brachial there was one case of gangrene, in 16 upon the femoral there was 1 case of gangrene, and also Billroth's fatal case of incision with ligature of both artery and vein, in which, on account of secondary hemorrhage, the artery had to be tied again above the origin of the profunda, and gangrene followed. On account of the known frequency of gangrene after ligature of the common femoral, we may regard this case as bearing only upon aneurisms so situated that a ligature of the common femoral would be necessary. The other case of gangrene from ligature of the femoral was Dupuytren's case of incision and ligature for a varicose aneurism in Hunter's canal, in which the arteries of the entire limb were degenerated, and in which the unnatural condition may have had something to do with the result. The case of gangrene after ligature of the brachial was a varicose aneurism of the flexure of the elbow operated upon by Roux with ligature of the artery alone above and below the sac, after continuous pressure and bandaging

part of the artery evidently being fed by the superior thyroid, as pressure in the course of that vessel caused the thrill to cease.¹

Ligature of both vessels.—A greater security against relapse from this cause is obtained by ligature of both the artery and the vein close to the sac. It is not absolutely necessary to ligate the vessels peripherally, for central ligature of both vessels has produced a cure in two cases (McCore, Keen²), although this practice is certainly not sufficiently reliable to be recommended for general adoption. In three cases the artery was ligated above and below, and the vein peripherally only, or centrally only, all being successful—unless we except Davies-Colley's (the second operation in this case), in which it was supposed that the catgut ligature softened prematurely, causing a partial relapse which necessitated a third operation in which the artery was ligated again below. In two cases both vessels were secured above and below. We have then 7 cases of ligature of both vessels, 6 cured, and 1 in which relapse took place from softening of the ligature on the artery. They include 3 at the flexure of the elbow, and 1 each of the temporal, femoral, popliteal, and tibial arteries.

We may note in passing that Monmonnier (Bramann, Case 93) cured an arterio-venous aneurism at the flexure of the elbow, of short duration, by obliterating the basilic vein above and below the point of communication, by passing pins beneath the vessel and making figure-of-eight turns of a ligature over them. Stromeyer claims to have cured a temporal arterio-venous aneurism by ligation of the vein alone beyond the point of communication, but he also ligated another vessel (which he thought to be a vein) which communicated with the varix and was accidentally wounded in the operation—moreover, the pulsation and thrill continued after the operation and the wound healed with long and tedious suppuration, so the cure may fairly be ascribed to the effect of this inflammation around the sac.

Incision and ligature—The so-called ancient method of treating aneurisms by incision and ligature of the vessels, with which we may also include the cases in which the vessels were ligated before the sac was laid open, is a more satisfactory method than simple ligature, and it is also generally easier of execution. The cases of incision of the sac with ligature of the vessels number 17. Among these there were 5 deaths and 1 recovery after amputation of the limb, but all of these accidents occurred in pre-antiseptic times, and they were all due to sepsis or secondary hemorrhage; the fatal cases being thus distributed—1 brachial, 3 femoral, and 1 popliteal, and the amputation having occurred in a pop-

¹ Dr. Stimson tells me that the man is still alive, the aneurism unaltered.

² Dr. Keen informs me that his patient was free from any return when he last saw her, about two years after the operation.

LITERATURE OF CASES.

To economize space I quote only the numbers of cases in Bramann's list which are correctly referred to by him, but I have verified his cases in the originals, except Cases 55 and 148, which were not accessible. I have included in my list only cases of four weeks' standing or more, for those of shorter duration are more correctly studied as wounds of artery and vein than as aneurisms.

Double Ligature of Artery.

- Dupuytren* : Breschet, Mém. Acad. roy. méd., Paris, 1833, iii. 226.
Norris : AMER. JOURN. OF MED. SCIENCES, 1843, v. 28. (First operation.)
Roux : Quarante Années de prat. chir., Paris, 1855, ii., Cases XXXVI. to XXXIX.; pp. 286 to 295.
Malgaigne : Bull. Soc. anat., Paris, 1858, xxxiii. 355.
Hamilton : Holmes, Lancet, 1874, ii. 543.
Blomfield : Lancet, 1881, ii. 829.
Davies-Colley : Guy's Hospital Rep., 1888, xiv. 348. (First operation.)
Championnière : Bull. Soc. chir., 1888, Paris, xiv. 39.
Branham : Internat. Journ. of Surgery, New York, Nov., 1890, p. 250.
Bramann : Arch. f. klin. Chir., 1886, xxxiii. 1. Cases 55, 66, and 117.

Ligature of Both Vessels.

- Moore* : Med.-Chir. Trans., xli. 1; and Brit. Med. Journ., 1857, 972.
Keen : Med. News, Phila., 1887, ii. (vol. li.) 725.
Roux : Loc. cit., Case XXXV. p. 271.
Davies-Colley : Loc. cit. (Second and third operations.)
Bramann : Loc. cit., Cases 89, 148, and 155.

Incision.

- Breschet* : Loc. cit., p. 219.
Bérard : Compend. chir. prat., ii. 127; and Arch. gén. méd., 1845, sér. iv. T. vii. p. 38.
Norris : Loc. cit. (Second operation.)
Brainard : Illinois and Indiana Med. and Surg. Journ., 1848, N. S. ii. 505.
Roux : Loc. cit., Case XL. p. 299.
Richet : Bull. Soc. chir., Paris, 1862, 281; and Gaz. des hôp., 1861, p. 215.
Nélaton : France méd., 1863, 197.
Nélaton : Reclus, Bull. Soc. chir., Paris, 1863, 285.
Billroth : Chir. Klinik. Wien., 1868, 158.
Verneuil : Reclus, loc. cit., p. 280.
Bramann : Loc. cit., Cases 46, 109, 3, 74, 8, 149, 156.

Extirpation.

- Ollier* : Mém. Soc. méd. Lyon, 1865, iv. Part 2, 159; and Reclus, loc. cit.
Beach : Boston Med. and Surg. Journ., 1867, lxxvii. 361.
Thorndike : Boston Med. and Surg. Journ., 1878, xcix. 475.
Robinson : Brit. Med. Journ., 1887, ii. 885; and Path. Trans., London, 1888, xxxix. 85.
Trélat : Delbet, Bull. Soc. chir., Paris, 1889, xv. 153, 491.
Menocal : Rev. de Cien. Med., Habana, iv, 1889, 161.
Graziani : Riforma Med. Napoli, Jan. 7-10, 1890.
Simons : Trans. South Carolina Med. Assoc., Charleston, 1890, p. 125.
Weir : Curtis, this paper.
Bramann : Loc. cit., Cases 49, 2, 7, 154, 122, 137, 10, 139, and 159.

had been kept up during the three years of its existence, and Roux very plausibly refers the gangrene to a diminution of the blood-supply of the limb, owing to this treatment. In addition to these 37 cases, there are 9 operations upon the popliteal, and 1 upon the axillary artery without gangrene—a total of 46 operations upon the main artery and vein of a limb with only 3 cases of gangrene, even including Billroth's, results which are so good that, bearing in mind the peculiar character of those 3 cases, we can safely say that in the ordinary arterio-venous aneurism (after a duration of one month) there is less danger of gangrene in securing both vessels near their point of communication than there is in applying the Hunterian ligature for true arterial aneurisms.

Conclusions.—We have seen that compression is only suitable for cases which are seen early, and in which the affected vessels lie superficially; and if it is not successful at once, or, if its employment is difficult or painful, the risks of operation are not sufficiently great to warrant delay. It is my conviction that all these cases should be treated by operation, with the single exception of the cases involving the internal jugular, or requiring ligature of the common femoral artery and vein. It does not appear necessary to distinguish between aneurismal varix and varicose aneurism as to treatment. The choice of methods depends upon the size and situation of the aneurism. In a general way, it may be said that all small aneurisms not involving the larger vessels of a limb should be extirpated unless important nerves are jeopardized by the dissection, or, as on the face, it is important not to leave a scar. The treatment selected for larger aneurisms depends upon their situation. Those of the neck which involve the external jugular vein will rarely require treatment, but should it be necessary, such cases are best treated by double ligation of both vessels. In other situations the simple ligature of the vessels should not be chosen, for it will, in most cases, require as much dissection as will incision or extirpation, while not giving the same immunity from relapse. The surgeon should make an incision down upon the sac in its entire length, and attempt to dissect it from its bed. If this prove difficult or impossible because of inflammatory thickening or intimate connection with important parts, the sac should be incised, for it is often easier to secure the vessels when the sac is freely opened. The sac could then be left entirely in place, or it could be partly removed, and it may be as well to say that suture and simple drainage of the sac have been found sufficient, and that it is unnecessary to resort to packing. In closing, we must not forget that the recently-introduced suture of veins, and the successful experimental suture of arteries, may alter our methods of treatment in some of these cases—in fact, Bassini (*Riforma med.*, 1890, April 15, 16) has already cured a case by double ligation of the artery and suture of the opening in the vein.

cisely outlines the morphology and biology of bacteria. He describes the nutrient media for them as found in the oral cavity, their development, and the part they play as excitants of fermentation, together with the action of the products of fermentation on the different structures of the mouth.

Under the head of "Prophylaxis of Dental Decay" is found much valuable information relative to the use of antiseptics in the prophylactic treatment of decay, the antiseptic action of filling materials, and the sterilization of teeth for the purpose of implantation.

Valuable data, the result of a great number of experiments and much research, are given in Chapter X., under the head of "The Pathogenic Mouth Bacteria, and the Diseases which They Produce"; also in Chapter XI., "Entrance-portals of Pathogenic Mouth Bacteria," together with a record of a series of careful experiments in the study of Pyorrhœa alveolaris, the infections resulting from accumulations of the excitants of diphtheria, syphilis, typhus, etc., in the oral cavity.

The tables showing the relative efficacy of the different antiseptic agents, and the comparative acidifying power of different articles of food, add much to the value of the work as a text-book of dental histology. Indeed, it may truly be said that in that capacity it will for a long time remain without a rival.

The general make-up of the book is all that could be desired. The illustrations are distinct and accurate, and the publishers are entitled to much credit for the excellent manner in which their part in the production of the work has been performed.

Now that histology has become a requirement in some of the dental schools, Professor Miller's work must quickly become indispensable to students as a text-book, nor can the practitioner of dentistry afford to be without it, and the non-professional reader also might derive much advantage from its study.

C. J. E.

DISEASES OF THE NOSE AND ITS ACCESSORY CAVITIES. By W. SPENCER WATSON, F.R.C.S. Eng., B.M. Lond., Surgeon to the Throat Department of the Great Northern Central Hospital; Senior Surgeon to the Royal South London Ophthalmic Hospital; formerly Assistant-Surgeon to King's College Hospital; Fellow of the Royal Medical and Chirurgical Society; Member of the Ophthalmological Society of Great Britain and Ireland; Member of the West London Medical and Chirurgical Society, etc. WITH SPECIAL SECTIONS ON DISEASES OF THE SKIN OF THE NOSE, ON INJURIES, ON RHINOPLASTIC OPERATIONS, AND ON EAR AFFECTIONS IN THEIR RELATION TO INTRA-NASAL DISEASES. By DR. ROBERT LIVEING, MR. WILLIAM ADAMS, and MR. A. E. CUMBERBATCH. Second edition, with numerous engravings and lithographic plates. 8vo., pp. 318. London: H. K. Lewis, 1890.

If our recollection of the first edition of this work serves us correctly, that volume, for its date, was a far more valuable exponent of its subject than the present one seems to be. Some portions are much more thorough, practical, and representative of progress than others. This in-

REVIEWS.

THE MICROÖRGANISMS OF THE HUMAN MOUTH. By WILLOUGHBY D. MILLER, D.D S., M.D. Pp. 364, with 130 illustrations, including Photomicrographic Plates. Philadelphia: The S. S. White Manufacturing Company, 1890.

THE publication of this remarkable record of experimentation and research cannot fail to meet with a most hearty welcome from practitioners of medicine, while the dental specialist will hail it as the most valuable of all recent contributions to dental science.

Previous to the publication of Professor Miller's investigations the presence of microörganisms in carious teeth was fully recognized, and that they might be found to be important factors in the decalcifying process often suspected; but the credit of fully demonstrating the correctness of what, previous to his investigations, was but mere conjecture, belongs entirely to Professor Miller. Objections have been made to his deductions on the ground that he has not entirely solved the problem of dental caries, that he throws but little additional light upon predisposing causes; but while Professor Miller has been able to demonstrate the fact that all microörganisms of the oral cavity which possess the power of exciting an acid fermentation of foods may, and do, take part in producing the first stage of caries, and also that all possessing a peptonizing or digestive action upon albuminous substances may take part in the second stage; and finally, that those possessing both properties at the same time may take part in the production of both stages, he has by no means ignored the predisposing causes of caries. In Chapter VIII., under the general heading of "Etiology of Dental Decay," the subject is very fully considered. In the pathology of the teeth it is not in every case easy to draw definitely the line between predisposing and exciting causes. This is clearly illustrated in the case of the third molars, the so-called wisdom teeth, which are generally believed to be predisposed to caries, even in mouths where the more anterior teeth are of good quality. In these third molars decalcification almost invariably appears on their buccal surfaces, as well as in the depressions of the crowns; but these teeth are, in consequence of their positions, beyond the sweep of the tooth-brush, and not usually brought into full service in mastication, hence they are nearly always covered with particles of amylaceous substances, which, remaining from day to day, undergo fermentation, and solution of the softened residue soon follows. Professor Miller very clearly shows that while the conditions which are usually considered as predisposing causes invite decay, they do not produce it, and that if the active agents are kept away decay cannot occur, no matter how inferior in quality the teeth are.

In "Microörganisms of the Human Mouth" Professor Miller very con-

Neuro-paralytic ulceration of the nasal mucous membrane is described, ulcers in connection with paresis of the fifth pair of nerves. This is a lesion which we do not remember to have been noted by other writers. The ulcers are said to progress steadily, though healing from time to time under generous diet and avoidance of exposure to cold. But one instance is mentioned, and in that one the patches of excoriation varied from the size of a split pea to that of an English sixpence. They were dry and sluggish, and increased in size from day to day, but almost imperceptibly.

These few points are illustrative of special practical features in the volume, which we are very glad to place beside its predecessor in the working portion of our library.

J. S. C.

A TEXT-BOOK OF PRACTICAL THERAPEUTICS; WITH ESPECIAL REFERENCE TO THE APPLICATION OF REMEDIAL MEASURES TO DISEASE AND THEIR EMPLOYMENT UPON A RATIONAL BASIS. By HOBART AMORY HARE, B.Sc., M.D., Clinical Professor of Diseases of Children and Demonstrator of Therapeutics in the University of Pennsylvania; Secretary of the Convention for the Revision of the United States Pharmacopœia of 1890. 8vo., pp. 622. Philadelphia: Lea Brothers & Co., 1890.

THERAPEUTIC handbooks multiply. *Materia medica* proper is in the background, and, to a considerable extent, justly so. The writer once heard a medical orator of deserved eminence (a surgeon) say in his address that the study of therapeutics should begin with medical botany, and then proceed upward through chemistry to its useful end. Most medical teachers, knowing the demands made upon the student for knowledge of diagnosis, and the great number of specialties in which a well-fitted man must attain a certain measure of proficiency, would say, with the writer, that although medical botany may be an elegant accomplishment for the practitioner, it is by no means a necessity, and to devote a large amount of time to it in an ordinary three years' course would be folly.

As a matter of fact, it is probably a very small proportion of students who have any real knowledge of botany of any kind, either when they enter or when they leave the medical schools of this country. Another view, and a much more plausible one, is that the student should be familiar with a large amount of experimental pharmacology; should, perhaps, have experimented himself, and upon this knowledge base his practical therapeutics.

I think most teachers of therapeutics would recognize the fact that a large amount of the experimental information gained within the last twenty or thirty years is of a kind which, if not useless for the study of practical therapeutics, is not capable of being utilized by the average student for that purpose, nor, indeed by any student, without very special and laborious study under skilled guidance.

The purely empirical school need not be dwelt upon. As a distinct school it is little in favor at present, but authors and teachers recognize the necessity of bringing to bear upon the study of the action of drugs,

equality is probably due to exigencies of practice favoring the author's experience in certain lines, in the discussion of which he is perspicuous and accurate, while he is discursive and uncertain in the discussion of certain other lines with which he is apparently less familiar. Hence many allusions are made to practices known to the author only from his extensive acquaintance with the writings of others. American authors receive a great deal of deference, especially Rumbold, Bosworth, and Sâjous. To the practitioner who fairly knows his subject the book will be of far greater service than to the novice. Due allowance can be made where the general advance in pathology and therapy has not been maintained, and due appreciation be accorded where its authority is most excellent. Few unusual affections will be encountered in practice concerning which some valuable instruction or information as may be, will not be found in these pages. The text takes in a wide range of subject-matter; external nose, interior of the nose, and the adjacent and intercommunicating cavities, passages, and structures, and almost every morbid condition which ever occurs in these regions receives some consideration. The descriptions of healthy and diseased structures are good and often elaborate. The constitutional origin of disease is duly expressed. The risks of delay and of temerity are recounted; the advice as to management is sound; the surgical treatment adopted is judicious and conservative. Haphazard and hazardous procedures receive no endorsement. The illustrations of diseased conditions and of many appliances for their treatment and correction are admirably portrayed, especially in connection with diseases of the maxillary sinus and with destructive diseases of the nose.

In describing the methods of illumination with minute electric lamps attention is directed to a risk of their cracking and breaking into fragments. Voltolini's lamps, however, are enclosed in thick glass capsules which, we fancy, would maintain their integrity even though the lamp underwent fracture. We fully endorse a recommendation of the Welsbach burner as a source of illumination.

An original method of controlling the palate during rhinoscopic inspection, and one which the author finds superior to all other plans, is that of directing the patient to breathe rapidly in short gasps and to concentrate his attention on his chest movements to divert it from his throat. A plan to relax the palate which we have often employed, and which we have not seen anywhere described, is to get the patient to keep his structures in the position of a laugh during the examination.

In using cocaine preliminarily to evulsion of growths, the recommendation is given to apply with cotton wads freshly-made solutions in equal parts of glycerin and water, a combination which is stated to favor its penetration into the cavity.

For seizing polypi and other morbid growths to prevent their escape from the forceps or the snare, a two-pronged corkscrew-shaped tractor is recommended, which can be twisted into the growth, a device which seems to us most excellent in conception. A ring-shaped knife is recommended for the removal of portions of turbinated bodies with the polypi upon them. A peculiar sliding forceps, one branch of which works within a slot in the other somewhat like a clamp, devised by the author for use where the ordinary scissor-playing blades could not be entered, appears to us admirably adapted to the purpose.

pioneer in this department of physiological research. This book is a reprint of Dr. Ferrier's lectures before the Royal College of Physicians. It is safe to say that it brings the subject entirely up to date. It is founded upon both experiment and clinical observations of the author and others. It is, of course, a statement of Dr. Ferrier's particular views, and is sometimes controversial, but the great amount of experimental work done by the author, and his accurate observation, go far to justify his conclusions, which his clear language so admirably sets before the reader.

Much of this book is necessarily a restatement of facts now generally accepted: this is true especially of the part devoted to the motor centres. In the remaining part a few points are especially noteworthy.

The author does not recede from his original position that the angular gyrus is the cortical centre for vision, although he enlarges the limits of the centre to include portions of the occipital lobe. Thus he speaks of the "occipito-angular region" as the visual area of the cortex. Complete destruction of this area in *oné hemisphere*, he says, causes permanent hemianopsia to the opposite side by paralysis of the corresponding halves of both retinæ, while bilateral destruction causes complete and enduring blindness of both eyes. Again, he says; the angular gyri are more particularly the centres for clear vision, each mainly for the eye of the opposite side. Hemianopsia accompanying cortical lesions of the occipital lobe proper, he thinks, is due probably to direct or indirect implication of the optic radiations. The opinion of Seguin and Nothnagel that the cuneus, or the apex of the occipital lobe, has a special relation to visual perception is not supported, Dr. Ferrier thinks, by experimental research. The apparent relation between lesions of the cuneus and hemianopsia is due to the special proclivity of this region to affection by morbid vascular conditions, and to coincident implications of the optic radiations of the occipito-temporal region. All these statements are clear and unequivocal, and the whole subject is elaborated at great length. As it is of great clinical importance it is much to be desired that experimenters should agree upon such a vital question. To be told that the cuneus has no connection with vision will disturb the acquired knowledge of many clinicians.

Dr. Ferrier gives the details of recent experiments to determine the auditory centre. His description of the actions of a dog-faced monkey in which he had excised the superior temporal gyrus on both sides is very graphic and conclusive as to the localization of hearing in this convolution. The facts of human pathology, the author thinks, undoubtedly support the view that the sense of hearing is localized in the temporal lobe, and more especially in the superior gyrus. Space does not permit an examination here of the claims to a localization of the tactile centre and of the centres for taste and smell.

The author gives due credit to the experiments of Horsley and Schäfer which demonstrate that the marginal convolution (the mesial aspect of the brain) presides over the trunk and hip muscles. It is noted, however, that to paralyze these muscles completely, which are bilaterally coordinated in this convolution, it is necessary to extirpate the centres of both hemispheres. This fact may be of some practical importance to the surgeon. For instance, the advisability of a cortical operation for obstinate torticollis was discussed recently in the Philadelphia Neurological Society. The question presents itself whether or not the muscles in-

and especially their remedial action, all the resources at our command, and of harmonizing not only the experimental data furnished by different observers, but the facts acquired by careful clinical observation.

It is from this point of view that all the recent text-books have been written, and the one before us is another claimant for favor in this class.

The author possesses special qualification for this task in the work he has done in experimental pharmacology; but he has, notwithstanding this temptation, avoided the error of basing his statements exclusively thereon, and endeavored to show the bearing and connection of the two sets of facts, and their application to actual practice.

The work is divided into four parts for convenience of reference.

After a concise introductory section the second takes up the drugs of the *United States Pharmacopœia* and others in general use, in the alphabetical order, giving first a very brief description of the drug itself, and then stating its mode of action and its application in disease, as well as the methods of administration. In the case of the more powerful drugs, the symptoms of poisoning and its treatment are given.

The third part treats of remedial measures other than drugs.

The fourth part consists of sections upon the treatment of diseases and symptoms, arranged in the same way.

It is out of the question to criticise minutely a work composed of so many short articles of varying importance.

In the present state of *materia medica*, with its enormous numbers of drugs containing the same or closely-allied principles, and the extreme rapidity with which new compounds are being added by the chemist, it appears to the writer that one of the wants is generalization. This, however, it would be unfair to find fault with this book for not attempting, as it is hardly compatible with its plan and arrangement.

It appears, also, to the writer, to be a mistake to try to present, in the compass here admitted, a systematic plan of treatment for each one of the whole alphabetical catalogue of diseases. There is either too much or too little. However, the attempt having been made in this instance, it is fair to say that it is by no means altogether unsuccessful. The treatment suggested is judicious and practical.

There are, as is likely to happen in nearly all first editions—and it is fortunate if they are not continued—a few slips.

We may suggest that a person who tries the author's first plan of disinfection (p. 319), by heating sulphur in an *iron* pan over an alcohol lamp, is very likely to find himself involuntarily trying the second, where the sulphur is mixed with the alcohol.

Again, it is not easy to understand how the water which has been used to scrub the floor of an infected room can be afterward boiled.

In a future edition the slight air of hurry and sketchiness which seems to attach to the present one can easily be removed. E.

THE CROONIAN LECTURES ON CEREBRAL LOCALIZATION. BY DAVID FERRIER, M.D., etc. London, 1890.

THE world of scientific medicine will welcome, in book-form, the latest authoritative statement of cerebral localization by the foremost

occasion to repent bitterly their successful efforts to prevent conception soon after marriage, resorted to in ignorance of their harmfulness. Altogether too much stress has been laid upon antelexion as a cause of sterility; we are too apt to grasp at this in the absence of definite knowledge. Who can pretend to say just what degree of contraction of the canal is sufficient to prevent the ingress of spermatozoa?

The operation of divulsion for stenosis of the os internum is touched upon briefly in comparison with the attention given to incision. "In contrasting the results obtained by division of the cervix with dilatation by tents," we read, "the former method seems to be attended by less[?] risks." We marvel at finding that posterior section is still taught as a safe method of treating cervical antelexion, an operation which has been almost entirely abandoned in this country. Surely some attention should be called to the fact, so clearly demonstrated by Wylie, that it is the complicating endometritis which should receive treatment as much as, or more than, the original flexion.

Confusion is introduced by discussing retroversion and retroflexion under separate sections. How often do we meet with a pure retroversion, considered from a strictly anatomical standpoint? The treatment of fixation of the retro-displaced uterus, the most common and important of these conditions, is passed over in silence.

The closing section bears the obsolete title, "Granular Degeneration of the Cervix Uteri." When we add that the author suggests no new line of treatment, but only the old-fashioned local applications—caustics, etc.—we have given the reader a sufficient idea of its scope.

With all due respect to his high reputation, we can only repeat what we said at the outset, that a man who has written an excellent work on gynecology, eight or ten years ago, does not follow the wisest course in publishing a separate chapter from the same in the form of a monograph, especially if the latter shows decided evidences of the fact that he has failed to recognize the enormous strides which have been made in this department of medicine during the past decade. The medical public at the present day has a right to expect in a monograph either originality or judicious and exhaustive compilation, both of which elements are wanting in the present volume.

H. C. C.

A DICTIONARY OF PRACTICAL MEDICINE. Edited by J. K. FOWLER, A.M., M.D. London, 1890.

THE editor of this dictionary, and the contributors thereto, are to be congratulated upon having been able to present, in these days of many-volumed treatises on medicine, so much real information concerning the subjects belonging to practical medicine within the moderate compass of a single octavo volume of less than a thousand pages. The dictionary contains upward of six hundred articles, most of them brief, but many of those upon the more important subjects fairly complete.

Among the more noteworthy articles may be mentioned: "The Diagnosis of Abdominal Tumors," "Acromegaly," "Albuminuria," "Bright's

volved in torticollis are bilaterally coördinated—*i. e.*, whether it would be necessary to remove the centre in both hemispheres? Dr. Ferrier's experiments do not appear to show this bilateral innervation. On the other hand, however, he says that there is reason for believing that the lateral movements of the head (and eyes) are not capable of being permanently paralyzed unless every portion of the frontal region be completely destroyed—a very heroic operation on man.

Dr. Ferrier is very positive that no form of sensation is localized in the motor cortex, and marshals a great array of facts, especially from recent autopsies and surgical cases, to support his position.

In conclusion, we are tempted to ask, Is the brain, after all, nothing but a sensori-motor ganglion? Are the rudiments of every idea a *sensation* and a *reflection*; has every psychic act a sensory and a motor aspect? This was practically the position of Locke, the greatest, most scientific English psychologist. Is he to be verified, even if only in part, by the experiments of the modern brain physiologists?

J. H. L.

STERILITY IN WOMEN, INCLUDING ITS CAUSATION AND TREATMENT.

By ARTHUR W. EDIS, M.D. Lond., F.R.C.P., Senior Physician to the Chelsea Hospital for Women; Late Obstetric Physician to the Middlesex Hospital, etc. Pp. 112. With thirty-three illustrations. London: H. K. Lewis, 1890.

As the author states in the preface, this monograph is simply a chapter from his former work on diseases of women, with some changes and additions, the latter being principally in the form of clinical histories. We confess that it is not easy to discover the *raison d'être* of the book, since the writer had nothing new to say and has not in publishing it added to his deserved reputation. The student does not need another monograph on this subject; the general practitioner will find it amply covered by Rceves Jackson's article in the *American System of Gynecology*; while for the specialist it is as elementary as it is antique. So much careful work has been done in this direction since the appearance of Sims's classic, that we are surprised to find that the writer has either overlooked or is not familiar with the recent French and German *brochures*.

In the introductory paragraphs attention is called to the possibility of sterility in the male. Too little stress is laid upon this point. The student should be taught that neither can the real cause of an unfruitful marriage be ascertained, nor can any truthful prognosis be given as to the results of local treatment until it is positively determined that the husband is not the guilty party. Injustice is constantly done to innocent women. Who will shield them from undeserved reproach, if not their physicians, who alone are in a position to learn the truth? Among the causes of sterility we notice that prevention of conception during the early years of marriage has not been mentioned. The family physician is a potent agent in the "prophylaxis" of sterility (if we may so term it) if he will only lay aside his mistaken notions of propriety and handle this delicate subject without gloves. Many women have

cine. Upon the whole, the dictionary may be said to be thoroughly up to date, and may be recommended to those who wish concise information upon the newest additions to medical knowledge. M. B. H.

STRICTURE OF THE RECTUM: A STUDY OF NINETY-SIX CASES. By CHARLES B. KELSEY, M.D. New York, 1890.

THE pamphlet before us contains the results of the author's experience in the treatment of stricture of the rectum. It is essentially a practical treatise, and is useful for this reason. After discussing the classification, symptoms, and diagnosis of stricture of the rectum, the author proceeds to a consideration of the methods of treatment. Dilatation, either alone or in connection with incision, is recommended as one of the most reliable agents in the treatment of this disease. The author very properly condemns the use of violence in practising dilatation; a bougie which is large enough to cause pain by stretching is always too large to do anything but harm. He advises the use of the soft-rubber bougie; a size being selected which will pass through the stricture without force and which may be left in place for several hours without causing uneasiness.

The treatment by incision, or external posterior linear proctotomy, is advocated in cases which cannot be cured by simple dilatation, and which are not caused by malignant disease. Out of the seventeen cases of proctotomy tabulated there were two deaths—both of which were cases of malignant stricture. We agree with the author's statement that neither theoretically nor from practical experience can the operation of proctotomy be recommended in malignant disease.

The treatment of electrolysis is dismissed with a few words. Electrolysis reduced to fact means, in the treatment of stricture of the rectum, either simple dilatation or the application of the cautery. The olive-pointed electrodes, placed against a stricture and gently pressed inward for ten or fifteen minutes, will cause exactly the same amount of dilatation and absorption whether the elaborate battery be connected with them or not.

The operation of excision is discussed and the technique of the operation is described. The operation should be performed as quickly as possible, bleeding being disregarded or controlled by sponge pressure until the whole diseased mass has been removed. The secret of success in extirpation of the rectum is to remove the disease as speedily as possible, and to control the bleeding by pressure during the operation and afterward until ligatures can be applied. The author states that in all his experience he has never seen a case of hæmorrhage which could not be controlled by direct pressure. There is a superstitious fear of hæmorrhage in the minds of men who have had but little experience in rectal surgery.

Colotomy is urged in suitable cases; the inguinal being preferred to the lumbar operation. As regards ease and certainty of performance, the subsequent cleanliness of the patient, and the ability to care for the opening, all the advantages are in favor of the inguinal operation. The dangers of the two operations are about the same.

Disease," "Fever," "Microorganisms," "Localization of the Lesions of Phthisis," and the numerous contributions upon diseases of the skin.

In discussing the prognosis of the various forms of albuminuria, Maguire expresses the opinion that "albuminuria, even when undoubtedly of functional origin, should always be considered as a diseased condition," and regards it as predisposing to attacks of acute Bright's disease. For the detection of albumin in the urine, preference is expressed for the magnesium nitric test of Sir William Roberts, because of its greater delicacy. We cannot agree with this author (Maguire) in the statement that cold is the most frequent cause of acute Bright's disease. On the contrary, we believe that the number of cases which arise from exposure must be small in comparison with those occurring as a sequel or complication of the specific fevers.

Fever (pyrexia) is defined by MacAlister as "a certain disorder of the body-heat, *usually* characterized by a rise of temperature." Can there be fever without a rise of temperature?

Mr. Victor Horsley, who contributes an article upon "Hydrophobia," accepts unreservedly the efficacy of the anti-rabic inoculations of Pasteur. While it is greatly to be desired that future investigations shall confirm the claims of those who advocate these inoculations, we do not think the question of their value is to be regarded as yet definitely decided.

We notice with pleasure a brief, but satisfactory, account of psorospermia, by Sutton. As yet, but little or nothing is to be found in the various text-books upon medicine concerning this subject, which is one of growing importance. Within the past few years, several cases of psorospermiosis in man have been reported; and recent observations have suggested the probability that certain epithelial proliferations, as molluscum contagiosum, are due to psorospermial infection. Indeed, some recent French writers claim that Paget's disease is a cutaneous psorospermiosis.

In the treatment of peritonitis, Williams adheres to the use of opium, no mention being made of the use of saline laxatives, which have recently been so much vaunted by some writers.

The editor contributes an article on the "Localization of the Lesions of Phthisis," in which he discusses the subject at some length. He endeavors to show that "the disease in its onward progress through the lungs, in the majority of cases, follows a distinct route, from which it is only turned aside by the introduction of some disturbing element," and he would make this fact of much importance in diagnosis and prognosis.

The various articles on diseases of the skin, which are written by Pringle, are exceedingly well done and contain much valuable information concisely and clearly presented.

Other articles of excellent quality might be mentioned, but want of space forbids their consideration.

In a few instances, it has seemed to us, an undue amount of space has been given to the discussion of unimportant subjects. As an example, an entire page is devoted to "Yawning," which, while interesting, perhaps, from a purely scientific point of view, can scarcely be regarded as of much practical importance. On the other hand, the subject of "Dyspnœa" is dismissed with less than a dozen lines.

Not the least valuable feature of this book is the thoroughness with which the various authors, as a rule, have incorporated in their contributions the most recent discoveries in the various departments of medi-

angina or of epilepsy, when a less quantity will be inoperative. Here, too, nitro-glycerin in the small dose advised will be found of trifling service unless administered *for effect* in increasing quantities. The dose of the latter is indicated as one minim of the one per cent. solution, and, in the posological table appended to the book, from one-half to two minims, no intimation being made of the necessity of the amount prescribed being regulated by the effect produced. As a rule, unless certain characteristic subjective symptoms follow its ingestion, the quantity administered is too small to be efficient. Tolerance is usually acquired so rapidly that the dose has to be steadily increased for its influence to be maintained.

We think the author shows singular freedom from insular prejudice in considering exophthalmic goitre under *B*, thereby placing Basedow's name before Graves's, and omitting the latter's altogether in the heading on the second page containing the outline of treatment of this disease. This, though probably an oversight, we cannot but regard as a trifle unjust to the memory of Graves, who, as is well known, fully described exophthalmic goitre five years before Basedow. The system of cognominal nomenclature of disease is not to be encouraged, but it is certainly desirable that where it cannot be avoided, credit be placed where it is due.

In the treatment of chronic hydrocephalus, following Gowers, the author advises that not more than an ounce of fluid be removed at a time. Unlike Gowers, however, Suckling believes that there is not much danger attending the operation. We entirely concur with him regarding freedom from risk, even when a much larger quantity is withdrawn. The smaller amount is, perhaps, all that should be removed in the first aspiration, or in subsequent ones, in cases where, the sutures having united, proper compression of the head, during and subsequent to tapping, cannot be applied. Practical experience and acquaintance with the literature of the subject permit us to assert that in suitable cases many ounces may be withdrawn entirely without risk, and with decided temporary benefit.

Suckling places a high value on chloralamide in insomnia, believing it to be the safest and most reliable of the hypnotics recently introduced. He considers sulphonal very uncertain in its effects, and regards paraldehyde as safe, but also uncertain. There is no doubt that sulphonal, as ordinarily prescribed, is uncertain, and that, however administered, it may cause disagreeable after-effects; but the same cannot be said of paraldehyde, which, in spite of its unpleasant odor and taste, still holds first place as a prompt and trustworthy sleep-producer.

It is stated that ophthalmoplegia interna is caused by syphilis, locomotor ataxia, diphtheria, and multiple sclerosis. It might have been well to add that many intra-ocular conditions may also originate it, such as glaucoma and various intra-ocular inflammations. It is one of the initial symptoms of sympathetic ophthalmia.

Regarding suspension in locomotor ataxia, the author holds the opinion now generally accepted by those who have given it a fair trial, that although it has in no case effected a cure, and often fails in affording relief, it may still be regarded as a most useful supplement to our armamentarium in the treatment of this disease.

D. D. S.

In describing the operation of inguinal colotomy the author makes two valuable suggestions. Before the selected portion of colon is attached to the parietes, it is drawn downward till it is held firmly by the mesentery above, and is then fastened to the edges of the wound in this position. This proceeding prevents prolapse of the mucous membrane from the upper segment, a sequel which has never followed in any of the author's cases.

The second suggestion is to use a harelip pin as the first step in fastening the gut to the abdominal wound. The pin is passed through the parietes and through the mesentery of the gut, thus firmly securing it so that it cannot be displaced should straining occur under the anæsthetic, or after. Again, it insures the formation of a sharp spur in the posterior wall of the gut.

The pamphlet concludes with a table of operations: proctotomy, colotomy, and excision. C. B. P.

ON THE TREATMENT OF DISEASES OF THE NERVOUS SYSTEM. By C. W. SUCKLING, M.D. (Lond.), M.R.C.P.; Professor of Materia Medica and Therapeutics at the Queen's Hospital; Extra Acting Physician to the Children's Hospital; Physician to the Workhouse Infirmary; and Consulting Physician to the Orthopædic and Spinal Hospital, Birmingham. 8vo., pp. 278. London: H. K. Lewis, 1890.

As the preface indicates, this little volume was prepared to serve as a complement to the author's earlier work on the *Diagnosis of Diseases of the Brain, Spinal Cord, and Nerves*. Dr. Suckling states his aim has been to render it a short and practical handbook of treatment. We think he has succeeded admirably. The diseases are arranged alphabetically; a concise definition precedes the outlined treatment in each instance where the name of the malady does not clearly define itself, and in many of the sections points of much value in diagnosis are interspersed. Indeed, in some of them semeiology is quite elaborately considered; that, for instance, on "Syphilis of the Nervous System" contains no less than seven pages devoted to the discussion of diagnosis, forming an excellent guide to the recognition of its various phases. When the size of the book, and the large number of subjects handled, are considered, it is surprising how completely yet concisely most of them are disposed of. In few instances does anything of importance seem omitted. Thus, though the chapter on "Convulsions" occupies less than three pages, it would be difficult to find anywhere in such brief compass so much valuable data as to diagnosis and treatment. It is of interest to note that the author here does not neglect to mention lead as a cause of eclampsia, and advises an inspection of the gums in cases of convulsions the origin of which is obscure—a point not often found in large treatises on diseases of the nervous system.

Amyl nitrite by inhalation is justly regarded as a valuable remedy in the paroxysm of angina pectoris where the blood-pressure is raised, but a much larger quantity may be required to influence the increased tension than the limit named—five minims. Ten, or even fifteen, minims rapidly inhaled will often succeed in aborting the paroxysm of

temperature to 103° . After twelve hours all of these symptoms abated; the temperature fell, and on the next day it was normal. A feeling of fatigue and pain in the limbs continued for a few days, and for the same period the site of the injection remained slightly painful and red. The smallest quantity of the remedy which will affect the healthy human being is about 0.14 minim (0.01 c. c.), or 1 c. c. of the one-hundredth dilution. This amount in most people causes slight pains in the limbs and transient fatigue. A few showed a rise of temperature to about 100.4° . The same holds good with regard to patients suffering from diseases other than tuberculosis; but the case is very different when the disease is tuberculosis, when such a dose, injected subcutaneously, causes a severe general reaction as well as a local one. The general reaction consists in an attack of fever, which usually begins with rigors, and raises the temperature above 102.2° , often to 104° and even 105.8° , accompanied by pain in the limbs, coughing, great fatigue, and often sickness and vomiting. In several cases a slight icteroid discoloration was observed, and occasionally an eruption like measles on the chest and neck. The attack usually begins four or five hours after the injection, and lasts from twelve to fifteen hours. Occasionally it begins later, and then runs its course with less intensity. The patients are very little affected by the attack, and as soon as it is over feel comparatively well.

The local reaction is best observed in cases in which the tuberculous affection is visible; for instance, in cases of lupus, changes take place which show the specific anti-tuberculous action of the remedy to a most surprising degree. A few hours after an injection into the skin of the back—that is, in a spot far removed from the diseased area on the face or elsewhere—the lupus begins to swell and to redden, and this it does generally before the initial rigor. During the fever the swelling and redness increase, and may finally reach a high degree, so that the lupus-tissue becomes brownish and necrotic in places where the growth was sharply defined. One sometimes found a much swollen and brownish spot surrounded by a whitish edge almost one centimetre wide, which again was surrounded by a broad band of bright red. After the subsidence of the fever the swelling of the lupus-tissue gradually decreases and disappears in about two or three days. The lupus-spots themselves are then covered by a soft deposit, which filters outward and dries in the air. The growth then changes to a crust, which falls off after two or three weeks, and which—sometimes after only one injection—leaves a clean, red cicatrix behind. Generally, however, several injections are required for the complete removal of the lupus-tissue. The changes described are exactly confined to the parts of the skin affected with lupus. Even the smallest nodules and those most deeply hidden in the lupus-tissue go through the process and become visible in consequence of the swelling and change in color, whilst the tissue itself in which the lupus-changes have entirely ceased remains unchanged. The observation of a case of lupus treated by the remedy is so instructive, and is necessarily so convincing, that those who wish to make a trial of the remedy should begin with a case of lupus.

The reaction of the internal organs, especially of the lungs, is not at once apparent, unless the increased cough and expectoration of consumptive patients, after the first injections, be considered as pointing to a local reaction in these cases; the general reaction is dominant, but we are justified in assum-

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

FRANCIS H. WILLIAMS, M.D.,

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KOCH'S TREATMENT OF TUBERCULOSIS.

THE researches of PROFESSOR KOCH will prove to be of such great importance, that an outline of what has thus far been published may well be considered at this time. Since the announcement, at the International Medical Congress last summer, that he had found a remedy which conferred upon the animals experimented on an immunity against inoculation with the bacillus of tuberculosis, and which arrested tuberculous disease, Professor Koch gave out in November a most important communication, which was published in many medical journals and in the newspapers.

The composition of the proposed remedy has just been disclosed—a glycerin extract of the tubercle bacilli. The brownish, transparent liquid which is used does not require special care to prevent its decomposition. When it is used it must be diluted, and these diluted solutions should not be kept, as bacterial growths soon develop in them, and they are then unfit for use.

Introduced into the stomach the remedy has no effect; it must be used subcutaneously, and every precaution must be taken to keep the syringe used perfectly clean. The most suitable site for the injection is the skin of the back between the shoulder-blades and the lumbar region. Here the injection leads to the least local reaction, and is almost painless.

The action of the remedy on man and on guinea-pigs is widely different. Calculated by body-weight, one-fifteenth-thousandth part of the quantity which has no appreciable effect on the guinea-pig acts powerfully on the human being.

After injecting four minims into his own upper arm, Professor Koch had pain in the limbs, fatigue, inclination to cough, difficulty of breathing, three or four hours after the injection. These symptoms rapidly increased during the fifth hour, and were unusually violent. A chill followed, which lasted almost an hour, at the same time there were nausea, vomiting, and a rise of

In two cases of facial lupus the lupus-spots were thus brought to complete cicatrization by three or four injections, the other lupus cases improved in proportion to the duration of the treatment; all of these patients had been sufferers for many years, having been previously treated unsuccessfully by various therapeutic methods.

Glandular, bone, and joint tuberculosis were similarly treated by large doses at long intervals. The result was the same as in the lupus cases, namely, a speedy cure in recent and slight cases; slow improvement in severe cases.

With phthisical subjects, who made up the largest number of the patients, the conditions were somewhat different. Those with decided pulmonary tuberculosis are much more sensitive to the remedy than those with surgical tuberculous affections. For them it was found necessary to diminish the dose, as they almost all reacted strongly to 0.002 or even 0.001 cubic centimetre; from this small dose it was possible to rise more or less quickly to the amount that is well borne by other patients.

An injection of 0.001 c. c. was first given to the phthisical patient, and from this a rise of temperature followed; the same dose was repeated once a day until no reaction could be observed. This dose was then increased to 0.002 c. c. until this was borne without reaction, and so on, increasing by 0.001 or at most 0.002 to 0.005 c. c. This mild course seemed to be imperative in cases in which there was great debility. By this mode of treatment the patient can be brought to tolerate large doses of the remedy with scarcely a rise of temperature. But patients of greater strength were treated from the first partly with large doses and partly with frequently-repeated doses. Here it seemed that the beneficial results were more quickly obtained.

The action of the remedy in cases of phthisis generally showed itself as follows: Cough and expectoration were generally increased a little after the first injection, then grew less and less, and in the most favorable cases entirely disappeared. The expectoration lost its purulent character and became mucous. As a rule, the number of bacilli decreased only when the expectoration began to present a mucous appearance. They then entirely disappeared, but were again observed occasionally until expectoration completely ceased. Simultaneously the night-sweats ceased, the patient's appearance improved, and he increased in weight within from four to six weeks.

Patients under treatment for the first stage of phthisis were freed from every symptom of disease and might be pronounced cured; patients with cavities not yet too highly developed improved considerably and were almost cured, and only in those whose lungs contained many large cavities could no improvement be shown. Objectively, even in these cases the expectoration decreased and the subjective condition improved. These experiences lead one to suppose that phthisis, in the beginning, can be cured with certainty by this remedy. This statement requires limitation, in so far as at present no conclusive experiences can possibly be brought forward to prove whether the cure is lasting.

Relapses may occur, but it can be assumed that they may be cured as easily and quickly as the first attack; it is possible that patients once cured may retain their immunity. Patients with large cavities will probably

ing that changes similar to those seen in lupus also take place. The remedy will form an indispensable aid to the diagnosis of tuberculous processes, and with its aid we shall be able to make a diagnosis in doubtful cases of phthisis where it is impossible to obtain certainty as to the nature of the disease by the discovery of bacilli or elastic fibres in the sputum, or by physical examination. Affections of the glands, latent tuberculosis of the bone, doubtful cases of tuberculosis of the skin, and similar cases, will be recognized. In cases of tuberculosis of the lungs or joints which have been apparently cured, we shall be able to make sure whether the disease has really finished its course, and whether there be still some diseased spots from which it might again arise as a flame from a spark hidden by ashes.

In lupus its action seems to be curative, but in what way it occurs cannot as yet be stated with certainty, as the necessary histological investigations are not complete. It is, however, certain that it does not destroy the tubercle bacilli in the tissues, but only that the tissue inclosing the tubercle bacilli is affected by the remedy. It can influence living tuberculous tissue only, and has no effect on dead tissue, as, for instance, necrotic cheesy masses, necrotic bones, etc., nor has it any effect on tissues made necrotic by the remedy itself. In such masses of dead tissue living tubercle bacilli may possibly still be present, and are either thrown off with the necrosed tissue, or may possibly enter the neighboring and still living tissue under certain circumstances in the therapeutic activity. If the remedy is to be rendered as fruitful as possible, the peculiarity in its mode of action must be carefully observed. At first the living tuberculous tissue must be caused to undergo necrosis, and then everything must be done to remove the dead tissue as soon as possible, as, for instance, by surgical interference. Where this is not possible, and where the organism is unassisted in throwing off the tissue slowly, the endangered living tissue must be protected from fresh incursions of the parasites by continuous application of the remedy.

The fact that the remedy makes tuberculous tissue necrotic and acts only on the living tissue, helps to explain another peculiar characteristic, namely, that it can be given in rapidly-increasing doses, in the course of three weeks to five hundred times the original amount. It is probable that in the beginning of the treatment there is a good deal of tuberculous living tissue, and that consequently a small amount of the active principle suffices to cause a strong reaction, but by each injection a certain amount of the tissue capable of reacting disappears, and then larger doses are necessary to produce the same amount of reaction as before. So soon as the point is reached at which reaction is as feeble as that of a non-tuberculous patient, then it may be assumed that all tuberculous tissue is destroyed. Then the treatment will only have to be continued by slowly-increasing doses and with interruptions, in order that the patient may be protected from fresh infections while bacilli are still present in the system; whether this conception and the inference drawn from it be correct the future must show.

In nearly every case of lupus the treatment was as follows: The full dose of 0.01 c. c. was injected, the reaction was allowed to come to an end, and then after a week or two the same amount was injected, continuing in the same way until the reaction became weaker and weaker, and finally ceased.

the body increases in weight. Obviously the method is one which will be of most service when applied early in the disease, and where there is not a large amount of material to be disposed of. For the conditions in the lung are not so simple as in lupus, for example, where the infiltrated tissue is readily thrown off. In the lungs the tuberculous tissue is killed, but it remains in the lungs, perhaps imbedded in cheesy material; in any case its expectoration is often very difficult. When these masses of tissue remain in the lungs they are a source of danger and a menace to the patient's life, for they contain bacteria which will renew their attack upon the system so soon as the treatment is stopped. This accounts for the fact that some patients who had ceased to react to the remedy, again reacted after an interval during which the treatment had been suspended. It will, therefore, be necessary to have patients under treatment for some time, and afterward at intervals test their immunity from a reaction to Koch's remedy.

In the out-patient department of the Charité Hospital in Berlin, Dr. Köhler and Dr. Westphal treated twelve cases of tuberculosis, including lupus and tuberculous affections of joints. The patients received injections of a one-per-cent. dilution of the remedy, beginning with a 1.6 m. (0.1 c. c.), which in some cases was gradually increased to 16 m. (1 c. c.). The syringe should be disinfected with absolute alcohol after each injection. The technique of the injection does not differ from that of giving an ordinary subcutaneous injection. As a rule, the injection is almost painless, and is accompanied by only slight local reaction. The usual general symptoms came on about six hours after the injection. From the time of the injection until the chill the patient had no discomfort, but with the chill there were headache, pains in the limbs and in the back, which disappeared as a rule on the next day. Some of the patients had with the chill considerable pain in the stomach and vomiting; with others these symptoms came on near evening, when the temperature was at its height, and disappeared with its subsidence.

While all tuberculous patients do not react in the same manner to the remedy, it is true that tuberculous patients are more susceptible to the action than non-tuberculous patients, the same dose being given in both cases. Most tuberculous patients have a chill after six hours, followed by fever, sometimes with a temperature up to 104°, which usually became normal within twenty-four hours. The pulse was increased during the fever up to 130-140 per minute. In some cases an exanthematous eruption, in others icterus, was observed.

The local appearances are most striking in lupus; in one patient who had lupus nasi a feeling of warmth, burning, and tension came on in two hours after the injection; three hours later the face was red; after five hours the parts affected had reached their maximum condition of swelling and redness. The swelling and redness were not limited to the diseased parts, but included neighboring parts. The affected parts, nose and upper lip, were also covered with an exudation in the form of yellow drops and crusts. Though the swelling and redness did not increase until the next day, the scabs were more numerous and thicker. The exudation did not appear to continue more than forty-eight hours. After two days the redness and swelling of the diseased spots and their vicinity began to diminish, and was limited, after five days,

obtain lasting benefit only in exeptional cases. Possibly some of these severely-afflicted patients may be relieved by a combination of this new therapeutic method with surgical operation, such as the operation for empyæma. The treatment will probably be quite simple in cases in which the beginning of phthisis and simple surgical cases are concerned, but in all other forms of tuberculosis medical art must have full sway by careful individualization and making use of all other auxiliary methods to assist the action of the remedy.

In many cases the decided impression was created that the careful nursing bestowed on the patient had considerable influence on the result of the treatment, and Professor Koch is in favor of applying the remedy in proper sanatoria, as opposed to treatment at home and in the out-patient room. How far the methods of treatment already recognized as curative, such as mountain climate, fresh air, special diet, etc., may be profitably combined with the new treatment cannot yet be definitely stated, but Professor Koch believes that these therapeutic methods will also be highly advantageous when combined with the new treatment.

The most important point to be observed in the new treatment is its early application. The proper subjects for treatment are patients in the initial stage of phthisis.

In the Charité Hospital in Berlin, Professor Frëntzel and Dr. Runkwitz have carried out Koch's treatment systematically, since September 13th, with Dr. Pfuhl's assistance. The new remedy was tried chiefly upon patients with phthisis, and, for purposes of comparison, upon patients whose lungs were healthy. Upon the healthy class small doses caused no reaction, but large ones were followed by a temperature of 102.2° , rigors, pains in the limbs, and exhaustion. In one case symptoms were caused which suggested the possibility of latent tuberculosis. The phthisical cases were of two classes, those in which the disease had made much progress, and those in which the progress was less marked. In four cases of the first class the progress of the disease was not stopped, in two of the cases no signs of healing were found after death. In eight cases, when the progress of the disease was less marked, the results were more satisfactory. One will suffice to suggest the general character of these cases.

A locksmith, twenty-one years old, of healthy family. In 1889, had swollen and discharging glands in the neck. Since May, expectoration and cough; from September 30th until October 3d, the expectoration was bloody. A tall man, of average development, with a flat thorax. Dulness in front on the right side to the second rib, behind dulness in the right supra-spinous fossa. Numerous râles over the right lung. The abundant bloody expectoration contained bacilli No. 6, counted according to Gaffky's method. Left lung free. After thirty-five days of treatment, the dulness on the right side was still to be recognized, râles few in number, but only found after coughing. No more blood expectorated; expectoration less and vitreous in character. No more night-sweats. Bacilli disappeared. Increase in weight one and a quarter pounds.

In the lighter forms of the disease the bacilli disappear for the time at least. The physical signs improve, the secretion is less, fever disappears, night-sweats cease, the cough is reduced to a minimum, the appetite is good, and

V. BERGMANN, by permission of Dr. Koeh, presented patients, and described the treatment received by them in his clinic.

The cases treated are divided into four classes :

1. Thirteen cases of tubereulosis of the skin, including tubereulosis of the pharynx.
2. Four cases of tubereulosis of the lymph glands of the neck.
3. Sixteen cases of tubereulosis of the joints and bones.
4. Four cases of tubereulosis of the larynx.

The difficulty of differentiating between carcinoma and tubereulosis will be obviated by Koeh's remedy, and the diagnosis will be positive. A better illustration of its value in this respect can scarcely be found than is afforded by these cases.

They demonstrate the fact that the subcutaneous application of Koeh's remedy in those organs attacked by the tubercle bacillus, viz., the skin, mucous membrane, lymph glands, joints, and bones, produces changes which are manifest in the swelling, reddening, increase of sensibility, and disturbed functions. These phenomena do not occur in other than tuberculous tissues—such as syphilis and carcinoma—or in healthy individuals. There is no remedy which produces an action analogous to this. This fact alone is enough to arouse the greatest interest, and to render it of great therapeutical value. Through the medium of the blood the diseased spot is influenced in a visible and positive manner. The local action is associated with a high fever, producing a rapid rise of temperature, rapid pulse, icterous discoloration of the skin, headache, nausea, vomiting, pains in the limbs, exhaustion, weakness. These are the first effects of Koeh's remedy.

These cases undoubtedly show, especially the patients with lupus and a child with coxitis, that the tuberculous tissues degenerate under the influence of the remedy.

The tuberculous ulcer on the alveolar process and hard palate is in process of cicatrization, one of the lupus cases is almost entirely cured, and the second case, Waechter, has lost most of the nodules, and her improvement is evident. The coxitis of Ziegelsdorf of a few weeks' duration has lost its sensitiveness, increased mobility, the swelling is hardly perceptible, and the formerly-flexed leg has been straightened without producing pain.

From all accounts the remedy should be used only in small (1 mg., $\frac{1}{10}$ m.) doses where there is much tuberculous tissue present, and only when the site of the disease is external, or when after using small doses it is found desirable to increase the dose, should large ones be employed (in children $\frac{1}{2}$ mg. or $\frac{1}{128}$ m.).

For use, one part of the remedy may be diluted with 99 parts of $\frac{1}{2}$ per cent. carbolic acid solution. One cubic centimetre of this solution would contain 0.010 or ten doses of 1 mg. each. This may again be diluted by taking one part of it and adding 9 parts of water, which would give (one part of the original liquid in 1000 of solution) 1 mg. in each cubic centimetre—a cubic centimetre is equivalent to m. xvj, or exactly m. xvj = 0.99 c. c. The injections are usually made by means of a special syringe which can be easily kept clean by washing in absolute alcohol and rinsing in water, though subcutaneous syringes of the ordinary pattern, but with asbestos packing in the piston, have been used.

to the affected places, and even these became much paler in the following three weeks.

Five days after the injection the scabs began to crumble, and on the ninth day could be removed easily. The nose was found to be no longer swollen, but smooth and pale-red over most of its surface, and was covered, as the other affected parts, with a delicate cicatrix. On the alæ nasi and their borders, as well as the nostrils, there were pale granulations, which were again covered with a scab within a few days, and they had fully cicatrized on the twenty-fourth day. On the fifteenth day there appeared on the smooth surface of the nose numerous soft red prominences about the size of a pin's head, often with a small blister, between them there remained the pale-red new cicatrix. The number of these small knobs and blisters increased to the day of the next injection. The injections were repeated after the twenty-seventh day three times, with intervals of two and one day. After each injection there appeared on that day swelling, redness, and exudation, but not with such intensity as after the first injection.

The total amount injected into this patient was a drachm of the one-per-cent. solution. In four cases patients who had old scars or wounds were chosen because they had no signs of tuberculosis, and to test the reaction of the remedy in such cases. No local changes in the wounds or scars were observed, but it was found that the remedy can cause general symptoms in non-tuberculous patients.—*Deutsche medicinische Wochenschrift*, November 4, December, 1890.

At the instance of Professor Gerhardt Dr. Hertel treated eighteen cases who had tuberculous affections of the larynx. The one-per-cent. solution, preserved with one-half per cent. of carbolic acid, was employed. At the site of the injection there was no special irritation.

In fourteen cases bacilli were found in the expectoration; in three others the tuberculous nature of the laryngeal disease was confirmed by the presence of lupus or physical signs in the lungs. In one the injection was made as a test.

The cases included four groups: First, those in whom, before the treatment, no signs of disease of the larynx were visible, but which became apparent after the injections. Second, patients who had what seemed to be disease of a tuberculous nature in the larynx, and which changed its appearance under the treatment. Third, such as suffered from undoubted tuberculous disease of the larynx; and fourth, two patients who had scarcely any general reaction from the remedy, and no local reaction in the larynx.

The experience of the few weeks' observation of these cases is as follows: The treatment renders the diseased spots more conspicuous. After a few milligrammes ($\frac{1}{16}$ grain) there appears, after a longer or shorter interval, a local reaction, sometimes accompanied by a general reaction, and sometimes without. The local reaction consists of a reddening and swelling of the diseased tissues, which changes its color in about twenty-four hours. Later a funnel-shaped ulcer forms in the middle of the diseased tissue. The diseased tissue shrinks, while there is greater or less discharge of mucus and liquid. Up to November 27th time enough for a cure had not elapsed, but the improvement has been continuous.

sodium. Thick cloths are wet with this solution, then applied to the affected parts, and then covered with a layer of rubber cloth so as to prevent evaporation. Almost immediate relief is obtained, and a cure is said to follow on the third to the fifth day.

Hunter recommends the injection of carbolic acid into the healthy skin at a distance from the part infected. This method of treatment is extremely painful, and is only applicable in severe cases of the face or hairy scalp.

Dr. Kraske advises making an incision in the healthy skin around the erysipelatous patch before applying the antiseptic substance.

Wölfler makes use of mechanical compression by bandages applied so as to circumscribe the inflamed tissue, while Dr. Kraske proposes elastic rubber bands to accomplish the same effect, where these are applicable.—*Therapeutic Gazette*, No. 10, 1890.

WHOOPING-COUGH.

Bromoform	gtt. x.
Alcohol	5j.
Distilled water	5ij.
Syrup	3ij.—M.

Sig.—One or two teaspoonfuls daily.

—*Revue de Thérapeutique*, No. 17, 1890.

SALOL COLLODION.

It is recommended to dissolve four parts of salol in four parts of ether, and then add it to thirty parts of collodion.

It is said that the application of the salol collodion to the affected parts in acute rheumatism will be followed by rapid relief of pain.—*Therapeutic Gazette*, No. 8, 1890.

[If collodion is applied to a joint it is well not to have it go completely around the limb, as collodion contracts strongly on drying, and might cause too much constriction.—ED.]

DEATH FROM A LARGE DOSE OF PARALDEHYDE.

Bridget O'B., twenty years old, was admitted to the fever hospital attached to the Cork Workhouse, suffering from typhoid fever. Through an oversight on the part of the attendant, she was probably given six or seven drachms of paraldehyde. In about five minutes she fell into an unconscious state, and, despite medical assistance, she died some hours later.—*Lancet*, August 20, 1890.

ARISTOL.

1. Aristol has been used in a pure state in sclerosis and other ulcerations in the male and female genitals. After washing the ulcers with carbolic or sublimate water, the aristol was powdered on and covered with gauze. In ulcers on the glans penis it is necessary to remove the bandage frequently on account of priapism; in these cases iodoform has the advantage over

[For the treatment of lupus and for purposes of diagnosis the remedy will probably be of value; in the treatment of tubercular diseases of the joints, in connection with surgical treatment, it seems likely to have a field of usefulness. Where the process has made little progress in the respiratory organs, there is reason to hope that we are to have a remedy better than anything thus far known, but great numbers of patients in advanced stages of consumption will be sadly disappointed.

In the treatment of tuberculous disease in animals it will probably lead to the saving of large sums, and as a prophylactic save human life by diminishing the chances of the spread of the disease to man.

Much criticism has been made about the delay in publishing the secret; but it is probably difficult to make the remedy of uniform strength and quality. The fluid is a violent poison, and carelessly-made preparations would soon bring the whole method into disrepute.

Professor Koch may feel well satisfied, not only with the results of his investigations thus far, but with the manner in which his statements have been received, for there is no one whose word commands more fully the confidence of the entire profession. Let the profession remember that the situation in which Professor Koch finds himself may be full of embarrassment, and before assuming that he has personally any ulterior motive for having withheld the secret of the preparation of his remedy, it is right to consider that in Germany his relations to his government may be such, and may since last summer have been such, as to compel him to do as he would not; in other words, his hand may have been forced from the beginning. Let us accord to Professor Koch none other than the highest, most generous, and humane motives.]

NEW METHODS OF TREATING ERYSIPELAS.

Rosenbach's method consists in washing not only the erysipelatous patch, but the entire neighboring surface, with soap and then bathing daily these patches with five-per-cent. solution of phenic acid dissolved in absolute alcohol. Very brilliant results are claimed to follow this method, both as regards the course of the disease and the febrile phenomena. Even absolute alcohol is said to produce a favorable action.

In Nolte's method the entire affected surface and surrounding zone are painted twice daily with a mucilage of gum-arabic containing from three to five per cent. of phenic acid.

The method of Koch consists in applying, by means of a camel's-hair pencil, the following ointment in a thin layer over the affected parts:

Creolin	.	.	.	.	.	.	.	1 part.
Iodoform	.	.	.	.	.	.	.	4 parts.
Lanolin	.	.	.	.	.	.	.	10 "

After the ointment is applied it is covered with a thin layer of gutta-percha. This method is said to be especially applicable to erysipelas of the face and of the hairy scalp.

In the method of treatment of Nussbaum and Brumm ichthyol is employed in collodion.

Hallopeau recommends the use of a solution of 1 part to 20 of salicylate of

is not in the form of glucose, and that an ordinary copper test can therefore not be depended upon to give accurate results.

These preliminary remarks show the nature of the faulty condition that has to be dealt with by treatment. If it were only a question of the waste of the carbohydrate principles of the food, there would be no reason against their being eaten and allowed to run off in the urine, provided sufficient other nourishment were given. The real harm is the result of the altered constitution of the blood, and the effects on the system in general which this alteration produces.

It may not be possible to restore the transformative or assimilative power which has been impaired or lost. Hence the only way of arriving at the desired end is to withhold from entering into the system the alimentary principles which lead to the passage of sugar through the circulation. These remarks apply to the class of cases embracing the majority of those beginning after middle life, in which the discharge of sugar is susceptible of control by treatment.

In the course of all the author's experience he has never known anything serious to arise as long as the urine was kept free from sugar. When, on the other hand, sugar is being voided, not only is the patient subjected to symptoms consequent thereon, but he is in constant danger of the supervention of more serious issues known to follow upon the disease.

The first consideration, therefore, is to control by dietetic measures the passage of sugar through the system. The real point, however, to be aimed at is the restoration of the assimilative power over the carbohydrate elements of the food. What most conduces to this restoration is the maintenance of a normal state of the system by keeping sugar from passing through it, and in this way bringing a healthy condition of the body to bear in helping to promote a removal of the faulty state.

Opium and its derivatives are, in the author's opinion, the medicinal agents which most assist in the actual cure of the disease and the restoration of the assimilative power. The benefit to be derived from these agents is often seen in cases in which mere dietetic treatment has reduced the sugar to a certain point, but fails to remove it entirely. When cases of a favorable nature are treated by these combined measures, the system of the patient frequently becomes finally able to tolerate a certain amount of carbohydrate food with benefit; but care must always be taken to keep the amount below that which produces an elimination of sugar in the urine.

When a case is found to have the assimilative power restored, it is permissible to call it *cured*; always remembering, however, that a weak point has existed which must not be unduly taxed.

ON THE INFLUENCE OF HUNGER ON THE SUSCEPTIBILITY TO INFECTIOUS DISEASES.

CANALIS and MORPURGO (*Fortschr. d. Med.*, 1890, Nos. 18 and 19) refer to the commonly-accepted idea that hunger and other weakening conditions predispose to the development of infectious diseases, but say that this has never yet been proved by detailed experiments, at any rate as regards insufficient nourishment. They give abstracts of the brief notices which have

aristol. In syphilitic and indolent ulcers or chancres the latter acts exceedingly well. Great cleanliness is necessary, especially about the female genitals. In fresh cases aristol has no advantages over iodoform.

2. Aristol was made use of with the best results in acute otitis media and otorrhœa in place of boracic acid, in lupus laryngis, laryngorrhœa, in ulcerations of the penis, and ulcers of the leg. In burns aristol (with oil or lanolin 10 per cent.) relieved pain, and caused rapid cure.

Aristol possesses the advantages of iodoform, and can even be used in children, with whom iodoform must be used carefully.

Aristol has not a penetrating odor like iodoform.

MEDICINE.

UNDER THE CHARGE OF

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THE PRINCIPLES OF THE TREATMENT OF DIABETES MELLITUS.

PAVY (*International Med. Congress*, 1890), referring to the nature of diabetes, says that it is with the carbohydrate principles that the faulty action lies. These, instead of being consumed and utilized, remain and are eliminated as carbohydrates. This is true, whether the carbohydrates are introduced in the food, or whether they are formed by the splitting-up of nitrogenous matters within the body.

With regard to the presence of sugar in ordinary urine, the author made a series of observations some years ago in which he definitely proved that it existed there in small quantities. He also found it normally present in the blood. A further series of observations made upon the blood of seven cases of diabetes showed that the amount of sugar in it was very greatly increased, and that there was a general agreement between the amount here and that escaping in the urine. The conclusion is, therefore, justified that the larger the secretion of sugar in the urine the worse in every direction is the condition of the patient suffering from diabetes; since the unnatural state of the blood cannot but induce a deviation from healthy action throughout the system.

The question arises as to the source of this abnormality of the blood. The long experience of the author, and the experiments carried out by him, convince him that it is due to sugar reaching the general circulation in a manner it ought not. In the normal condition the ingested carbohydrates are restrained by the liver from entering the general circulation. The author has proved this to be the case by analyzing the blood in the portal vein and that in the general circulation, and showing that a large preponderance of sugar is encountered in the former, if examined after the ingestion of carbohydrate matter. It is necessary, however, to bear in mind that this sugar here found

also until dead. They do not, however, take the disease if starvation is commenced only at the time of inoculation.

11. Adult white rats experimented on remained entirely immune from anthrax, even when allowed to starve a comparatively long time before inoculation.

THE NATURE AND TREATMENT OF TABES.

STRÜMPPELL (*Münch. med. Wochenschr.*, 1890, 39, 667), in an interesting article upon this subject, says that, though there are so many and so varied symptoms of tabes, there are certain of them which seem to be almost invariably present. Such are the three initial symptoms—the evidence of sensory irritation in the skin, legs, arms, trunk, or head, the abolition of the patellar reflex, and the characteristic alteration of the pupil. In a later stage are almost constantly seen the development of certain disturbances of sensation, of bladder symptoms, and of ataxia of voluntary motion. To explain these facts, we should have to assume, even if we knew nothing of its pathological anatomy, that the disease was one in which certain tracts of fibres in the brain and cord were affected according to some law. The determination of just which fibres is, however, a matter of exceeding difficulty. That the degeneration is nevertheless systemic seems now proven beyond a doubt.

We may define tabes as an exceedingly complicated disorder of the nervous system, in which there are in the peripheral nerves, spinal cord, and brain numerous tracts of fibres diseased with at least partial involvement as well of the ganglion cells from which the fibres arise. The disease always begins as a degenerative atrophy of the nerve-fibres. Its distribution always stands in the closest relations to the physiological property of the fibres. Certain systems always become easily and completely diseased, while others are more rarely or only slightly affected. The order in which the fibres are attacked is by no means always the same, though certain rules seem to obtain. The rapidity, too, with which the disease extends from one system to another is subject to great variations. Its point of starting, too, may be most variable.

As regards the cause of tabes the author denies the active influence of exposure to cold, excesses, traumatism, and heredity. He agrees entirely with Fournier, the first to claim that tabes occurred almost or quite exclusively in those who had at some earlier period in their lives suffered from syphilis. He has yet to see a case in which the possibility of a preceding syphilitic infection could be positively excluded. It is a mistake, however, to consider tabes as at all a form of tertiary syphilis, due to a syphilitic affection of the vessels; for the anatomical changes are totally different from syphilitic new-formations, and antisyphilitic treatment is usually entirely unavailing. The degenerative changes of tabes are to be considered as the result of a post-syphilitic intoxication of the body. Thus it is exactly analogous to the paralyses seen after diphtheria; which are the result of a widespread degeneration of the nerves, which has nothing anatomically in common with the primary diphtheritic changes. The nerve-lesions in diphtheria are simple degenerative conditions due to the action of a chemical poison arising within the body. The origin of tabes the author believes to be similar to this. As in the case of all other toxic degenerations of like nature, there

appeared in medical literature bearing upon this subject, and then proceed to detail their own experiments.

The bacilli of anthrax were chosen as those with which to experiment, and pigeons, chickens, and white rats as the animals to be experimented on, since these animals are possessed of comparatively greater resistance to the bacilli, and therefore permitted of observations on differences in the degree of susceptibility.

Series of experiments were performed on pigeons by inoculating them after starving them for several days, or by beginning the starving process immediately after the inoculation was performed, or by starving them first and then beginning to feed them at the time of inoculating them, or, finally, by inoculating at the time the starving was commenced, and later feeding them again. In other cases the whole or the greater part of the pancreas was removed before inoculation, since this gland is especially important to animals which consume cereals.

Observations were also made upon the vitality of the anthrax bacilli after being introduced into the bodies of pigeons.

Experiments of a similar nature were performed on chickens and on white rats, both of which animals are even more resistant to infection by anthrax bacilli.

The effort was also made to determine whether the depression of temperature which accompanies a starving condition was itself the actual cause of loss of immunity against the disease.

The authors deem the following conclusions justifiable :

1. Animals naturally immune from infectious disease can be made susceptible through hunger.
2. Pigeons, usually immune, always die of anthrax when starving is commenced at the time of inoculation.
3. Pigeons which have been starved during six days before inoculation do not take anthrax if feeding is at once commenced immediately after inoculation. If the starvation lasted more than six days they, as a rule, take the disease.
4. The readministration of food will retard the course of, but will not prevent the development of anthrax if the pigeons are allowed to fast during two days after inoculation.
5. Total or partial extirpation of the pancreas usually renders pigeons susceptible to anthrax during a limited time.
6. Anthrax will finally develop in inoculated pigeons, even if starving is not commenced until eight days afterward. Hence:
7. The bacilli of anthrax, introduced under the skin of immune pigeons, remain alive and virulent for several days.
8. The loss of immunity in pigeons cannot depend on the depression of temperature accompanying starvation, since the disease is not taken if a similar depression be produced in other ways, and the animals be meantime abundantly fed.
9. Chickens also may be made susceptible to anthrax through hunger.
10. The majority of the animals of this species died of anthrax if they were made to starve for three to seven days before inoculation, and after it

A PARASITIC PROTOZOA IN CARCINOMATA.

SJOEBRING (*Fortschr. d. Med.*, 1890, No. 14, 529), in studying the process of nuclear division in the cells of a carcinoma of the breast, noticed peculiar bodies which he subjected to a careful investigation and discovered them to be microorganisms. He describes these and illustrates their life-history in a lithographic plate.

This microorganism first appears in the form of an exceedingly small, round, protoplasmatic body; seeks a cell-nucleus; penetrates it, and remains there during the first stage of its existence. It then passes out into the body of the cell, or even entirely outside of this. In this period of its existence it grows at the expense of the cells of the tumor, and particularly of their nuclei, its destroying influence being exerted not only on the single cells but upon the entire surrounding tissue. When the microorganism has reached full maturity it nearly fills the cell containing it. At this period it surrounds the cell-nucleus, softening its lining membrane, and absorbing its contents into itself; the achromatin of the nuclear protoplasm appearing in the form of hyaline drops, filling the greater part of the plasmodium, and the chromatin forming a little mass among these.

A membrane now develops around the plasmodium, the hyaline drops become changed into a more homogeneous mass; very minute, curved, rod-like bodies develop in this, and are each surrounded by a small, hyaline, highly-refractive mass, which finally becomes distinctly encapsulated. These fully-developed spores, to the number of twenty or thirty, are contained within and fill the plasmodium as in a spore-cyst; through which they probably finally burst. The rod-like bodies probably last of all burst through the capsule of the spore and develop into the young sarcodes at first described.

The author was never able to discover a nucleus colorable with hæmatoxylin at any period of the development of the microorganism. On this account he classifies this body as a sporozoa, probably belonging to the group of the microsporidia.

The size of these microorganisms varies greatly, from one or two up to fifteen micro-millimetres in diameter. As regards the frequency of their occurrence the sarcode forms are very numerous, several being found in each cell, apart from those occurring in the nuclei. The larger forms, connected with the spore-formation, are seen much more rarely.

The author has found this parasitic body in six out of seven cases of cancer of the breast in which he has sought for it. In the seventh case it was not to be discovered with certainty.

In two other cases of cancer of other parts of the body, he has sought for and found them.

URIC-ACIDÆMIA.

V. JAKSCH (*Deutsche med. Wochenschr.*, 1890, 33, 741) has examined the blood of patients in the effort to determine:

1. Whether uric acid took part in the acid intoxication occurring in febrile conditions.

exists an intimate connection between the nature of the poison and the nerve-fibres acted upon; each poison being a poison for only certain regions of nerve-tissue, and harmless to others. In this way it can be understood why tabes must be a systemic affection. It is also clear that though mercury and iodine may destroy syphilitic new-formations, they need not be at all active against a chemical toxine.

The author believes that the various crises are best accounted for on the ground that they are of toxic origin. In fact, he knows of no other way to explain them with any satisfaction.

In opening his remarks on the therapeutics of tabes the author refers to several points which he thinks deserve more attention than is usually accorded to them. First, that slight or rudimentary cases of tabes are not of rare occurrence. It is possible that such cases, suffering only from the earliest symptoms, may have all the indications of nerve-irritation disappear, and no further advance be made in the disease.

A second important point is, that there is seen in tabes the sudden failure of certain nerve-functions, which may then gradually recover their previous condition—it may erroneously be supposed, under the influence of therapeutic measures. He believes that these conditions are the result of the sudden inhibitory action of the poison on certain nerve-areas, without there being any actual destruction of them. Recovery takes place just as in cases of severe morphine-narcosis, curare-paralysis, and the like, after the action of the toxic agent has ceased.

The third point of prognostic-therapeutic importance is that all circumstances producing over-strain or weakening of the body in general, or particularly of the nervous system, diminish the resisting power of the nerves to the morbid agent; while the reverse is likewise true, that proper hygienic and dietetic measures exert an inhibitory influence upon this agent. The author particularly emphasizes the importance of avoiding all over-exertion in cases which have as yet shown no traces of affection of the gait.

As to the treatment of tabes, it is evident that no great influence can be exerted in any way upon nerve-fibres already atrophied. The treatment by suspension may, in many cases, be followed by temporary symptomatic benefit, but certainly, he believes, never by any permanent good.

The antisymphilitic treatment can be of no avail against the disease as already developed. It may, however, be tried for two reasons. First, it is conceivable that syphilis still exists in the body, and that by the employment of inunctions in early cases of tabes, the development of further changes may be prevented or at least retarded. He confesses that he has not much hope of any such action. A second reason is that a true specific syphilitic affection of the nervous system—as a gumma—may develop, giving rise to symptoms like those of tabes, or that such a growth may be present in addition to the true tabetic changes. Since it is by no means easy to determine this matter positively during life, the energetic and prompt employment of treatment by inunction is highly to be recommended. We have not yet learned the true method of treatment, which is the employment of such methods as will modify or render powerless the chemical processes going on in the diseased body.

cold. The remaining red blood-cells lost consistence and exhibited great irregularity in shape; while the plasma was tinted by the escaped hæmoglobin and contained masses of hæmatin. That these changes were in reality dependent on cold was further shown by the experiment of placing a ligature around a finger and then immersing the finger in cold water. The blood in this finger alone underwent alteration. Accompanying the pigment in the urine was a proteid consisting mainly of globulin. The pigment from the broken-down corpuscles is originally excreted as oxyhæmoglobin, then passes through a preliminary stage of methæmoglobin before becoming converted into acid hæmatin while in contact with the acid urine in the bladder.

The author dissects the nature of the varieties of hæmoglobin, classifying them as—1, acid hæmoglobin (methæmoglobin); 2 and 3, alkaline hæmoglobin (oxy- and reduced); 4, acid hæmatin; 5 and 6, alkaline hæmatin (oxy- and reduced).

Just as acid hæmatin can be changed by the action of reagents into either form of alkaline hæmatin, so methæmoglobin can be converted into either variety of alkaline hæmoglobin, and the process may be repeated backward and forward any number of times.

It appears probable that paroxysmal hæmoglobinuria is only an exaggeration of a physiological phenomenon. The red blood-corpuscles are constantly undergoing destruction in the circulation during health, but the products of this destruction are used up in the system. If the destruction be only, though during some time, just beyond the normal limit, the system is unable to make away with the products, and albumin appears in the urine. If the destruction be great, though only for a short time, hæmoglobin will appear as well; or methæmoglobin if the pigment be retained in the tubules of the kidney or in the bladder for any length of time.

It has been shown by several writers that temporary albuminuria may follow cold bathing or other exposure to cold in persons otherwise apparently healthy. It has also been found that this occurs at times in persons subject to paroxysmal hæmoglobinuria. In the light of what has been stated, the author deems it impossible that either of these affections can be due to disease of the kidneys.

It cannot, however, be denied that there must be some peculiarity of the red blood-cells in paroxysmal hæmoglobinuria which renders them unduly sensitive to the influence of cold. This is probably to be sought in some disorder of the blood-making apparatus which renders the corpuscles less resistant. This is borne out by the fact that the corpuscles in these cases tend to assume fantastic shapes on the slightest pressure, and do not run into rouleaux, even when there has been no paroxysm for a length of time. Syphilis is a probable cause of this diseased condition. It was present in all of the eight cases reported. Malaria and gonorrhoea may possibly also exert some influence.

THE DIAGNOSTIC VALUE OF TUBERCLE BACILLI IN THE SPUTUM.

Fussell, in 1887, published the results of his examination of the sputum for tubercle bacilli in 100 cases of pulmonary disease, and concluded that the presence of the bacilli was proof positive of the existence of tuberculous

2. Whether it took part in the production of gout or attacks of gout.

He refers to the statements which have already been made in support of this view, but says that investigations in the matter have never been carried out on a large number of patients.

In all he examined the blood of 105 cases in a manner described by him. In 9 instances of healthy individuals no uric acid was found. In nervous diseases it was also absent, and the same was true of 9 cases of typhoid fever. In another case of this disease and in one of intermittent fever there was no uric acid present during the elevation of temperature, though it was detected after fever had disappeared.

In the instances of diseases of the liver, stomach, and intestine examined, uric-acidæmia was only observed when anæmia was also present.

The acid was found in diseases of the heart which produced cyanosis, as also in emphysema and pleural exudates. It was constantly present in considerable quantity in the febrile stage of five cases of pneumonia. In six cases of acute articular rheumatism there was no uric-acidæmia observed.

Very considerable quantities of uric acid were found in all the cases of diseases of the kidneys, and in those of primary and secondary anæmias.

These observations seem undoubtedly to prove that uric-acidæmia is not a pathognomonic symptom of gout, and that it is not a factor in the production of the acid intoxication seen in fever. Fever, indeed, appears to influence unfavorably the production of uric-acidæmia.

It is a noticeable fact that it occurs in renal diseases, anæmias, and in all processes in which the blood is overloaded with carbonic acid. Even in pneumonia the fever is not sufficient to neutralize the action of the carbonic acid in producing this condition.

He does not hesitate to state that uric-acidæmia is due to disease of the red blood-cells, the oxygen-carriers of the blood. Thus, in cyanosed conditions the carbonic acid diminishes the vital energy of the blood-cells; in nephritis, they are not capable of neutralizing the large amount of retained uric acid, and in anæmia the cells are not sufficient in number, and uric-acidæmia therefore appears.

THE PATHOLOGY OF PAROXYSMAL HÆMOGLOBINURIA.

COPEMAN (*Practitioner*, 1890, xlv., 3, 161) records a series of careful observations made upon seven cases of paroxysmal hæmoglobinuria. He details the clinical histories of these cases, the important features being that exposure to cold for a short time would be immediately followed by shivering and blueness, with depression of the bodily temperature. An elevation of temperature next took place, accompanied by hæmoglobinuria. Various experiments were performed by varying the duration and method of exposure to cold. The influence of local cold was determined by dipping the hands in cold water, etc. The blood was also drawn from the finger and examined during the period of hæmoglobinuria, and the evidences of the destruction of the red blood-corpuscles noticed.

The results of these observations and experiments showed that one of the first and most obvious phenomena of the disease consists in an enormous and rapid destruction of the red blood-cells, depending on the direct influence of

ageal vagus. had a similar effect. After section of the cord the general tension of the stomach upon its contents was lost, and as a result the organ became decidedly larger than in the case of animals whose nervous system had remained intact. If after section of the vagus the serous layer of the stomach was irritated by the faradic current, a powerful contraction was produced at the seat of irritation, but did not advance beyond this point. Faradic stimulation of the cut œsophageal vagus, however, even shortly after death, produced powerful, wave-like contractions in the pyloric half of the stomach, similar to those described.

The empty stomachs of dogs which had fasted from twenty-four to seventy-five hours were small, flaccid, and either entirely without movements, or exhibiting only rarely a weak contraction.

2. *Pylorus.* Observations on the pylorus showed that when the stomach was full it was closed during the whole period of digestion, and for the first four to eight hours did not allow a single drop of nourishment to pass it. Toward the end of digestion the finger could with difficulty be pushed through it from the duodenum, but not before this time. The emptying of the stomach took place suddenly in four or five squirts, the result of a single peristaltic contraction no stronger than those which had preceded it. After food, and then again each contraction for a time drove food into the duodenum. These observations prove that the emptying of the stomach is accomplished not only by the gastric contraction, but that the pylorus has the independent power of opening and closing.

As for the condition of the pylorus when the stomach is empty, our knowledge is not so definite. In all the author's experiments on dogs which had had no food for from twenty-four to seventy hours the pylorus was found closed, and resisted the pressure of the finger from the intestine, though not so powerfully as during digestion.

Section of the vagus or decided curarizing of the animal caused the pylorus to open even when the stomach was full; but section of the cervical cord at the second vertebra was without effect. Irritation of the gastric mucous membrane of the stomach increased the contraction of the pylorus; while irritation of the mucous membrane of the pylorus appeared to diminish the gastric peristalsis. This relation probably prevents the stomach from sending too much of its contents into the duodenum at one time.

The ingestion of much cold water intensified the contraction of the stomach for a time, but relaxed the pylorus completely, so that the large amounts of fluid rapidly passed into the intestine, thus preventing too great a dilution of the food. This opening of the pylorus occurred whether the stomach was full or empty.

3. *Duodenum.* During the whole of the process of digestion the duodenum was entirely without movements of its own. Even when mutilated or irritated in most various ways no movement could be produced. The secretion of the intestinal juices, bile, and probably of the pancreatic juice went on, however, continuously during the digestive period. About the time when the pylorus opens, just before the gastric contents pass through it, peristaltic movements began in the duodenum and continued and increased in strength until the stomach had entirely emptied itself.

phthisis, while their continued absence was good, though not positive, proof of the absence of phthisis.

FUSSELL and KEILY (*Univ. Med. Mag.*, 1890, iii. 85) now publish a further series of 65 cases, in which the examination of the sputum confirms these conclusions. Of the 65 cases, 44 had undoubted physical signs of phthisis; 4 had doubtful physical signs, yet tubercle bacilli were found in all. The authors give the further clinical history of these 4 cases, which later progressed as ordinary cases of phthisis.

8 cases had no physical signs of phthisis, and bacilli were absent from the sputum of all of them. 9 cases had doubtful physical signs, and bacilli were absent in all. These 9 cases were of especial interest, since in some of them it seemed exceedingly probable that phthisis was present. All of them, however, recovered.

CONTRIBUTION TO THE STUDY OF THE MOVEMENTS OF THE STOMACH, PYLORUS, AND DUODENUM.

A valuable paper appears from the pen of ROSSBACH (*Deutsch. Arch. f. klin. Med.*, 1890, B. xvi. 276) on the movements of the stomach, pylorus, and duodenum. He reviews what has been done by investigators in the study of the subject, and then details his own observations and experiments. The experiments were performed entirely upon dogs, and consisted in first rendering the animal as quiet or as insensible to pain as possible by the use of curare or morphine, then exposing the stomach and preserving it in as normal a condition as possible by the application of warm, wet cloths, or by filling the abdomen with warm physiological salt solution and then covering it with a warm glass-plate. After this preparation, observations were made upon the movements of the stomach and duodenum, and on the state of the pylorus under different conditions of fulness and emptiness of the stomach and under such influences as irritation of the vagus or the ingestion of cold or hot water.

The results of these observations were as follows:

1. *Stomach.* In the case of the stomach when full of food the peristaltic movements were at first weak, and then, becoming stronger, lasted 4-8 hours. They occurred only in the half of the stomach nearest to the pylorus, the other half was entirely free from movements during the whole period of digestion, and compressed only moderately the gastric contents. The movements always began about the middle of the stomach—the first appearance being as though a cord were deeply constricting the organ—and then passed in waves toward the pylorus, each wave consuming about twenty seconds in its passage. The wave-like motion was so deep at the acme of the digestive period that it temporarily obliterated the lumen of the stomach. Especially was this the case as the wave approached the pylorus. The presence of not too large a quantity of cold or warm beverages increased the force of the peristaltic movements. Large amounts of cold water, however, stopped them entirely for a long time, and made the organ icy cold. Deep morphine- or chloroform-narcosis weakened and retarded them greatly, without, however, causing them to cease during digestion. Section of the spinal cord at the region of the second cervical vertebra, or of the œsoph-

condition, this change consisting in paroxysms of severe abdominal pain, vomiting, distention of the abdomen, and obstinate constipation. From the commencement of this stage until it terminated the symptoms were briefly as follows:

1. Rapidly-increasing distention of the abdomen, commencing in the umbilical region, and subsequently involving the whole abdomen.
2. Paroxysms of abdominal pain, becoming each day more and more agonizing and subdued only by repeated hypodermic injections of morphine.
3. Vomiting frequent, but fluctuating, not constant, bilious, once or twice feculent.
4. Obstruction of the bowels almost complete. On only a few occasions some wind and a scanty amount of feces came away, without giving any relief.
5. Rapidly-increasing emaciation, which became finally extreme.
6. A normal or sub-normal temperature.
7. A pulse of fair volume during the greater part of the time, and of moderate frequency—i. e., under 100. Until toward the termination of this stage it was never extremely rapid.
8. At times difficulty in micturition and more or less tenesmus.
9. A sudden relief to the obstruction, occurring when the boy was almost dead.

With regard to the third period—i. e., from the termination of the illness until the present, there are two events to record—the attack of paroxysmal abdominal pain which occurred during convalescence from his illness, and the attack of diarrhœa and vomiting which occurred some months after, and lasted about two days.

On reviewing the case, the diagnosis seems to rest between—(a) An intussusception. (b) Typhlitis leading to obstruction by producing local paralysis.

The question of intussusception is one deserving of some consideration. There are, undoubtedly, some points in the case which favor this diagnosis:

1. The suddenness of the onset.
2. The first symptom being sudden pain.
3. The presence of diarrhœa during the first part of the illness, which in intestinal obstruction is suggestive of intussusception.
4. The moderate distention of the abdomen for several days.
5. The fact that an indistinct tumor was felt in the right iliac fossa for a couple of days.
6. The change in the symptoms on the nineteenth day may have been due to an increase in the invagination leading to obstruction.
7. The sudden relief may have been due to spontaneous reduction of the invaginated bowel, the other method of spontaneous cure being excluded by the fact that no portion of gangrenous intestine was subsequently discharged.

The chief difficulties which lie in the way of acceptance of this diagnosis are:

1. The early fever. Still, in some cases of intussusception fever has been noted. Treves, in his excellent manual on *Intestinal Obstruction*, when speaking of the temperature in intussusception, says: "It will be below normal in cases associated with shock. In the majority of the cases, and especially in such as are subacute, it is normal, or a little above normal. It is important," he continues, "to recognize the fact that there may be a rise of temperature in intussusception apart from any evidence of local peritonitis."
2. The early local tenderness in the right iliac fossa.
3. The absence of bloody stools.
4. The long duration of the illness, which would be greatly against the possibility of spontaneous reduction, as it would be very unlikely

It is evident that there must be a nervous connection between the innervation of the stomach, of the pylorus, and of the duodenum. The physiological law might be formulated that irritation of the gastric mucous membrane acts reflexly, producing a stronger innervation of the pyloric muscle, and an inhibition of the movements of the duodenum, but finally a relaxation of the pyloric muscle and an irritation of the motor nerves of the muscle of the duodenum. The result of the resting of the duodenum during gastric digestion is clearly to prevent the removal of the intestinal secretions poured out in the bowel, in order that they may remain in the immediate vicinity of the stomach ready to neutralize and act upon the acid gastric contents when these are finally passed out.

SURGERY.

UNDER THE CHARGE OF

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A REMARKABLE CASE OF INTESTINAL OBSTRUCTION.

DR. WALLACE BEATTY (*Dublin Journal of Med. Science*, third series, No. 126) reports in detail a case which he saw with Sir William Stokes and with Dr. Head, and the course of which he summarizes as follows, the patient being a boy ten years of age: A sudden commencement—the first symptom being abdominal pain followed by diarrhœa, and in about twelve hours by vomiting. The symptoms during the first four days not very urgent; his condition then was abdominal pain of moderate severity, tenderness on pressure in the right iliac fossa, some tension of the abdominal walls, a temperature of 99°, a rather weak pulse, and a thinly-furred tongue.

From the fourth day until the nineteenth—i. e., until the termination of the first stage—his condition was: 1. Some diarrhœa; the motions were sometimes liquid, sometimes formed, never scybalous. 2. Some fulness and tension of the abdominal walls; this was not at all great, and seemed to lessen each day. 3. Slight tenderness in the right iliac fossa. 4. Moderate fever, the highest temperature reached being 101°. 5. A small, indistinctly-felt tumor in the right iliac fossa, present at the end of this stage; and 6. No vomiting. Most of this time the boy felt very well and hungry, and was disappointed at being kept on low diet.

The treatment during this stage was a restricted liquid diet, a few drops of Battey's solution every three or four hours, leeches and wet compresses to the right iliac fossa.

The symptoms during the second stage were—a sudden change in the boy's

knee-joint. He did not suffer much pain, but found that he was absolutely unable to extend the leg. On examination, the knee-joint was found to be slightly swollen, and the patella was drawn two inches upward from its normal position and was freely movable from side to side. For twenty-four hours the treatment consisted in flexing the thigh upon the body and dressing the limb upon a Volkmann splint; then the leg was brought into a position of maximum extension and a plaster bandage was applied. In eight days this fixed dressing was removed, and the injury was dressed precisely in the manner advised by Trélat in the treatment of patellar fractures. Immediately above the superior border of the displaced patella was fitted a gutta-percha plate; this was secured in position by strips of adhesive plaster carried circularly around the thigh. Over this was applied a plaster bandage extending from the toes to the groin; this was allowed to harden while the leg was held in a position of extreme extension. On the following day an oval trap was cut in the plaster large enough to expose the gutta-percha plate and extending downward to the tuberosity of the tibia. One extremity of the Malgaigne hook was now secured to the gutta-percha plate, the other to the plaster bandage covering the upper extremity of the tibia. On turning the screw the patella was readily drawn to the normal position, except that its lower edge tilted somewhat forward. This was corrected by a compress. After twelve days the patella was found to be secured in its normal position by the healing process. The plaster bandage was allowed to remain for eight days, and was then replaced by an articulated salicylate bandage. Six weeks after the injury the patient was allowed to leave his bed, but no flexion was permitted in the knee-joint for several days. Then the articulated dressing was so arranged that slight flexion was possible; gradually greater freedom of motion was allowed, till in ten weeks flexion to almost a right angle was possible and extension was perfect. Five years later the patient showed absolutely no trace of the injury, the function of the leg being perfect.

THE OPERATIVE TREATMENT OF THROMBOSIS OF THE SINUSES.

Since Dr. Lane reported a case of septic thrombus of the lateral sinus successfully treated by trephining of the skull, followed by incision into the venous channel and evacuation of its purulent contents, the outlook for operation in cases of intra-cranial complications dependent upon otitis media has been decidedly brighter. Two more cases, one resulting fatally, the other recovering, are now reported by SALZER (*Wien. klin. Woch.*, iii. Jahrg., No. 34). The first case gave a history of discharge from the left ear of many years' duration. Shortly following mechanical irritation, occipital headache, fever and vomiting were noted; followed by pain referred to the cervical vertebræ, swelling of the spleen and the physical signs of lobular pneumonia. The pulse was abnormally slow. An examination of the urine showed blood, hæmoglobin, albumin and pus. In a few days the mastoid region was tender, swollen, and œdematous, the patient at the same time becoming somnolent and apathetic. On incision, a pus-discharging opening was found at the posterior border of the temporal bone. The dura was exposed by means of the chisel; a considerable amount of extra-dural pus was evacuated, and the lateral sinus was laid open and cleared of a septic thrombus. The exploring-needle failed

that adhesions would have formed precluding the possibility of such reduction.

How is the attack of pain with visible peristalsis, which occurred during convalescence, to be explained if we assume that the illness was due to intussusception? Perhaps it was due to a fresh invagination which reduced itself, or, perhaps, to a temporary obstruction due to a weakened condition of that part of the bowel which had been invaginated.

The question of typhlitis remains to be considered. During the first stage of the illness Dr. Beatty believed that the case was one of typhlitis, on account of the early tenderness on pressure in the right iliac fossa, the abdominal tension, the fever, and the presence, after some days, of a small tumor in the situation of the cæcum. The sudden onset is quite compatible with typhlitis, as it usually begins suddenly.

The sudden intestinal obstruction which occurred on the nineteenth day would be accounted for by paralysis of the cæcum, due to inflammation. This was Sir William Stokes's view; and, taking all the symptoms into consideration, it seems to be the true explanation of the case. But there are, no doubt, some difficulties in the way of accepting this view.

1. Why was diarrhœa present during the early part of the illness? Constipation is the rule in typhlitis.

2. How did the obstruction give way? Perhaps it was that on the approach of death a general relaxation of the intestines took place, and as the accumulated contents of the cæcum made their way out.

3. If the typhlitis was severe enough to produce paralysis of the cæcum, is it not strange that the inflammation did not spread to the cellular tissue behind the cæcum and lead to perityphlitis and abscess? There was no evidence of suppuration either during or after the illness.

THE TREATMENT OF SUBCUTANEOUS RUPTURE OF THE LIGAMENTUM PATELLÆ.

A case of this rare injury, together with a non-operative method of treatment entirely satisfactory in its result, is detailed by BRUNNER (*Correspondenzbl. für Schweiz. Aerzte*, No. 19, xx. Jahrg). According to Maydl, of forty-six cases suffering from an injury of this nature and treated by means other than incision and suture, twenty-seven were entirely cured, while the remainder suffered from a greater or less disturbance of function. It is certain, however, that many of the imperfect cures were due to intercurrent traumatism or to an imperfect or not sufficiently long-continued treatment, and, moreover, that the majority were reported before sufficient time had elapsed to allow of complete restoration of function. Hence the statistical study does not offer a fair basis for a calculation of the chances of success attendant upon treating subcutaneous rupture of the patellar ligament by splints and compresses.

In the case reported, the patient, a heavy man, aged forty-four years, exhibited for many years the characteristic symptoms of the rheumatic diathesis. From comparatively slight violence he sustained a fracture of the tibia just below the knee-joint. For this he was required to wear a splint for a long time. Some months later, while in the act of sitting down, he heard a crack in the

That enterostomy, or the formation of an artificial anus, should never be performed unless it is found to be absolutely impracticable to reëstablish the continuity of the intestinal canal by dividing the constricting bands by enterorrhaphy or by means of lateral apposition as described.

SUTURE OF THE BLADDER.

In an elaborate article (*Annales des Maladies Org. Genito-urin.*, vol. viii., No. X.) upon the suture of the bladder, DR. DELEFOSSE arrives at the following conclusions:

1. Vesical suture should not be employed in at least two-thirds of the cases of hypogastric section, on account either of the object of the operation itself, or of the condition of the vesical walls, or of the interior of the bladder.

2. It is only absolutely indicated when there is an intra-peritoneal wound of the bladder wall. When a wound of the bladder is extra-peritoneal, vesical suture should be employed when the bladder and kidneys are healthy and the urine is normal.

3. In the great majority of cases of hypogastric section in which the use of the suture has succeeded, a partial suturing or none at all, with the employment of siphon drainage, would give equally good results. Delefosse concludes his article by quoting, with approval, the opinion of Hache, who says that the dangers associated with complete suture are not compensated for by the advantages which may result from it.

EMPYEMA OF GALL-BLADDER.

DR. WEST HUGHES (*Annals of Surgery*, vol. xii., No. 5) reports a case of suppurating gall-bladder, with cholecystotomy, in two stages, and recovery, giving his reasons for selecting that method: In empyemic distention the walls of the gall-bladder are thickened, non-elastic, and somewhat friable. It would be a difficult proceeding to evacuate the contents through a trocar or by aspiration, enlarge its opening and suture its edges to the wound, without allowing some of the fluid to escape into the peritoneal cavity. In simple distention, the walls being thin and elastic, there would be no necessity for performing the operation in two stages. In such cases the opening in the gall-bladder and the abdominal wound may be sutured separately, the gall-bladder being returned to the abdominal cavity. But a simpler and safer operation (Tait) is to suture the edges of the bladder-opening to the edges of the wound and insert a drainage-tube into the bladder. At the end of a few days the tube can be removed. Then if the obstruction has been entirely relieved, the fistula will readily heal. If the obstruction still exists (and of this the operator can never be absolutely sure recur, the wound could be torn open with the finger, or with some blunt instrument, without the administration of an anæsthetic. But if the gall-bladder should have been sutured separately, then in case of a recurrence another operation would be necessary. The indication that there was no longer any obstruction in this case was the escape of bile from the fistula, the

to find pus-collection in either the temporal lobe or in the cerebellum. Death followed seven days later from septicæmia and lobular pneumonia. The autopsy showed diffuse suppuration beneath the dura and tentorium, and a thrombus extending from the left into the right lateral sinus.

The second case also suffered from a long-standing middle-ear disease on the left side. The characteristic symptoms of intra-cranial involvement were: apathy, somnolence, with delirium at times, hyperæsthesia, and epileptiform convulsions of the right side of the body, trismus, disturbance in speech, rigors, fever, and, finally, tenderness and swelling over the mastoid process. On opening the skull much pus was evacuated. An area of sphacelated dura was excised, the non-pulsatile sigmoid sinus was incised, and pus and septic thrombi were evacuated, and the wound was packed with iodoform-gauze. Recovery, though slow and complicated by prolapse of the cerebrum, was complete.

The most characteristic symptoms of septic thrombosis of the lateral sinus are, probably: tenderness along the course of the internal jugular vein, evidences of disturbed circulation in the region of the ear, and the symptoms attendant upon emboli being carried to other parts of the body. None, however, are pathognomonic, so that the diagnosis can only be made at the time of operation. Puncture with the needle of a hypodermic syringe will at once determine whether or not the lumen of the venous channel is occluded. If its contents are septic, immediate evacuation is the only rational treatment.

TREATMENT OF CERTAIN FORMS OF INTESTINAL OBSTRUCTION.

JESSETT, after detailing (*Medical Press*, New Series, vol. 1., No. 2684) some original experiments, formulates the following conclusions: 1. Obstruction of the intestines, the result of constricting bands or volvulus, is always met with either in the small intestine or the sigmoid flexure. 2. The most common cause of bands is old peritonitis, local or general; Meckel's or other diverticula may be the cause of constriction of the bowel by snaring or twisting. 3. The predisposing causes of volvulus consist in elongation of certain segments of the intestine, abnormal length of the mesentery, adhesions, or unequal peristaltic action. 4. The higher in the intestine the obstruction the more severe usually are the symptoms. 5. All cases of obstruction should be treated by early abdominal section, and, if possible, reduction of the constricted portion of the intestine by dividing the constricting bands or untwisting a volvulus, that is, if the gentle insufflation of hydrogen gas fails to effect reduction. 6. In all cases where the intestine is very distended, it should be freely incised and its contents evacuated. 7. In all cases in which the constriction is irreducible lateral anastomosis by approximation disks should be practised so as to exclude permanently the seat of obstruction from active fecal circulation. 8. In cases where gangrene has taken place in the loop of constricted intestine, it should be excised, and the portion of intestine above and below the seat of constriction should be united by lateral anastomosis by approximate plates, the divided ends being invaginated into themselves. 9. All bands and diverticula should be removed when practicable at the time of operation; in the case of volvulus, if the mesentery is abnormally long, it should be shortened. 10.

its broad base corresponding to the upper and posterior part of the canal. The skin covering it was somewhat reddened. The deeper parts of the ear could not be cleaned. Upon inflation a quantity of offensive pus oozed out through the chink between the growth and the opposite meatus wall, and then the patient felt relief in his head. The hearing in this ear was greatly reduced.

In consequence of the retention of secretion in the ear, "an irritative process had been set up in the dura mater, of either a congestive or a reflex nature, manifesting itself in headache and vertigo." The indication was, of course, to open up the canal in order to allow the pus to drain off, and also, if possible, to cure the disease in the middle ear. Therefore the patient was chloroformed, and the external auditory canal disinfected by a 1 : 1000 solution of corrosive sublimate, when a superficial incision was made with a bistoury through the entire length of the tumor in the direction of the axis of the canal. The tumor was then laid bare and gouged off by two or three strokes of the hammer, beginning in front of its base, so that a thin lamella of the posterior bony wall was removed with it. There was a great deal of hæmorrhage, so that a small ridge of bone at the lower portion of the canal was overlooked. This was thrown off as a sequestrum in two weeks. The tumor was 7.5 mm. long and 6 mm. wide, and 5 mm. high, composed of spongy, bony tissue, excepting the external layer, which was compact. The auditory canal was syringed with a four-per-cent. solution of boric acid and well tamponaded with iodoform-gauze. Forty-eight hours afterward a rubber drainage-tube was substituted for the iodoform tampon. During the first week the slightest touch upon the bony wound caused a marked vertigo and almost unconsciousness. In four weeks all symptoms had gone, and the head felt free; as it had *not* done for five years. The bony wound healed in four weeks. There was finally seen, when the membrana tympani became visible, a large perforation in its lower half, with the handle of the malleus drawn well inward. The hearing for the watch-tick was now 1 cm., and ordinary conversation at three metres. Four months after the operation there was still no return of the otorrhœa.

A SECOND CASE OF INJURY OF THE BULB OF THE INTERNAL JUGULAR VEIN FROM PARACENTESIS OF THE MEMBRANA TYMPANI.

DR. HILDEBRANDT, the assistant in Professor Trautmann's aural clinic in Berlin, gives an account (*Archiv f. Ohrenheilkunde*, vol. xxx., September, 1890) of the above-named injury, similar to that lately given by Ludewig, as occurring in Schwartz's clinic in Halle. A little girl, four years old, once the subject of otorrhœa, but which had been cured, complained suddenly of earache in the right ear. The membrana tympani had become lustreless, red, and bulging in the lower posterior quadrant. Immediately after an extensive paracentesis, a stream of dark blood gushed from the cut, and flowed from the external meatus in a stream as thick as the little finger. The tampon was applied immediately, the quantity of blood lost being 100 c. c. The hemorrhage stopped at once, and none appeared in the throat through the Eustachian tube. All pain in the ear ceased immediately. In two days the tampon was removed, when the incision was found to be healed. The

contents of the gall-bladder at the time of operation being entirely free from bile. Of course, there never was any obstruction in the common duct, since there was never any jaundice.

EXCISION OF THE CHANCRE TO ABORT SYPHILIS.

H. LELOIR (*Journal de Médecine*, No. 42, vol. ii. p. 618, 1890) reports two interesting cases of excision of chancre. The first was the case of a young man who had had connection with a syphilitic woman. Medical examination made on the day after coitus showed that the woman had chancres and glandular involvement; and some days later the appearance of roseola and mucous patches. The young man was placed under close observation, and directed to examine himself very frequently.

Nineteen days after the coitus a papule appeared on the prepuce. This was excised freely, and the base cauterized upon the morning of its appearance. No glandular involvement could be detected. Six weeks later the symptoms of constitutional syphilis were developed.

In the second case, a man who had never had syphilis, contracted a sore on the prepuce from a woman, who was proved, by medical examination, to be syphilitic. The sore appeared twenty-four days after coitus, and presented every appearance of a chancre. There was slight induration of the inguinal glands, which the patient stated had existed before the appearance of the sore. The chancre was excised five days after it was first observed. The wound healed readily without induration. The man was kept under observation for four months, and examined carefully twice a week, without the appearance of any symptoms of syphilis.

OTOLOGY.

UNDER THE CHARGE OF

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OPERATION FOR EXOSTOSIS OF THE EXTERNAL AUDITORY MEATUS.

DR. HEIMAN, of Warsaw, reports (*Archives of Otology*, vol. xix., July, 1890) a very interesting example of obstructive exostosis in the auditory canal, with an operation for its relief.

A man, twenty-six years old, had suffered long from purulent otorrhœa in the left ear. At last, in August, 1888, he noticed that the discharge was not so great, and at the same time he suffered from violent headache in the corresponding temporal and occipital regions. Examination now revealed a slight paresis of the left side of the face, and slight percussion of the left temporal and mastoid regions was painful. The bony external auditory canal was occluded by a bony tumor, sensitive to the touch, but immovable,

indications of caries in the head of the malleus, and cannot be cured in any other way.

Dr. Randall, however, prefers to rely on other methods, like injections into the attic, as he has not found excision of much value.

THE FORMS OF NEURITIS OCCURRING IN THE ACOUSTIC NERVE AS THE RESULT OF MENINGITIS.

PROFESSOR GRADENIGO, of Turin, has published (*Annales des Maladies de l'Oreille*, September, 1890) the results of further study of this question, in a paper read at the recent Congress at Berlin. He has demonstrated that grave bilateral purulent infiltrations of the acoustic and facial nerves in the internal auditory canal, sufficient to destroy the nervous fasciculi of the cochlear nerve, where these penetrate the tabula cribrosa, are almost constant symptoms of cerebro-spinal meningitis and also of otitic and tuberculous meningitis. Bacteriological examination of microscopic sections revealed in the pus about the seventh and eighth nerves the existence of the same micro-organisms which had provoked the meningitis, viz., the diplo-streptococcus lanceolatus in cerebro-spinal meningitis, and the bacillus of Koch in tuberculous meningitis. Furthermore, Gradenigo detected in the mucous membrane of the vestibular wall of the tympanum these pathogenic organisms in the region of the canal of Fallopius, so that he inclines to the belief that this canal constitutes in cerebro-spinal meningitis the path of transmission of virus from the internal auditory canal to the middle ear. Thus the pathogenesis of purulent otitis media so often following the otitis interna of cerebro-spinal meningitis, can be explained.

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

UNDER THE CHARGE OF
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GUNSHOT-WOUND OF THE PHARYNX AND LODGEMENT OF THE MISSILE WITHOUT ANY SUBJECTIVE SYMPTOMS OF ITS PRESENCE.

DR. EMIL ARONSON, of Libau, has recorded (*St. Petersb. med. Woch.*, No. 36, Sept. 1890) a unique case of the lodgement in the pharynx of a cylindrical iron projectile weighing nineteen grammes, and four and a half centimetres in length, without producing any subjective symptoms whatever of its presence as a foreign body. A man invented a projectile to be held in the mouth and to be discharged at will by blowing a plunger down upon the fulminating compound. He had not taken the recoiling force of the explosion into consideration, and so the first time he tried his projectile it not

malleus was sharply retracted. The membrana was pearl color in its anterior portion, but in the posterior quadrant there was still a bluish-red prominence, the size of a pea. It was subsequently observed that this prominence varied in size at times. The reflection of light in the anterior lower quadrant changed its shape when strong pressure was made on the side of the neck over the internal jugular vein, and then returned to its normal form when the pressure was removed from the side of the neck.

It was concluded by Prof. Trautmann that the prominence visible in the lower posterior portion of the membrana was the bulb of the internal jugular vein protruding through a dehiscence in the floor of the drum-cavity. The patient received no injury from the accident. It was observed in this case that the veins of the right side of the face, especially the external jugular, the anterior and posterior facial veins, were fuller than those of the other side. The patient was rhachitic, and bore the marks of this diathesis in the joints and cranium.

AURAL COMPLICATIONS OF GRIPPE.

DR. MÉNIÈRE, of Paris, laid his conclusions (*Annales des Maladies de l'Oreille*, September, 1890) on this subject before the French Otological and Laryngological Society, May 10, 1890. He states that aural complications are the result of retro-nasal affections. Of fifty-seven cases, twenty-three lasted four or five weeks. In eleven cases the lesion was unilateral; in seventeen, bilateral. In another series of sixteen cases, nine were unilateral and seven were bilateral, and the duration of the disease was three months. Eight lasted four months, and five were still under treatment by reason of complications—as periostitis and mastoid inflammation. The treatment consisted in warm-water irrigation in the external canal and in the Eustachian tube, paracentesis of the membrana tympani in some cases, and in four instances thermo-cauterization of the mastoid.

SUPPURATION OF THE TYMPANIC ATTIC AND PERFORATION IN SHRAPNELL'S MEMBRANE.

DR. B. ALEXANDER RANDALL, of Philadelphia, contributed a very interesting paper on this important subject to a recent number of *The Philadelphia Medical News* (September 27, 1890). "The successful treatment of these cases is, of course, the special end of their study, and the questions of the origin, frequency, and seriousness of the lesions are of fundamental importance." If ear disease is not a large element in the practice of the physician, "it makes up for it by its serious importance." "It is not without cause that suppurations of the ear are bars to life insurance; and more often in these than in any others do we have caries just where the meninges are nearest."

In his investigations, Dr. Randall has included cases of perforation in Shrapnell's membrane, with and without concomitant perforations in the membrana tensa—the portion below the line of the folds of the drum-membrane. As a rule, those without any concomitant perforation in the membrana tensa are (in our experience) the most serious, and are those which demand excision of the membrana tympani and the malleus, as they are

DERMATOLOGY.

 UNDER THE CHARGE OF

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 IMMIGRANT DERMATOSES.

In the *Journal of Cutaneous and Genito-urinary Diseases* for October, 1890, WHITE describes the various dermatoses possessing contagious or inoculable properties which are being gradually introduced into this country through immigrants, especially by the less desirable immigrants. Thus, it is known that the relative frequency of scabies is much greater than formerly; the same may be stated, but to a less degree, of favus. The possibility of an increase in the cases of lupus and also of melanosis lenticularis progressiva (xeroderma pigmentosum) is pointed out; and the discovery of imported cases of leprosy is becoming not at all uncommon. It would seem, moreover, that prurigo is no longer such an extreme rarity here as formerly. The author suggests the following measures for Governmental adoption :

1. To cleanse all immigrants of animal parasites, on landing, by treatment of person and clothing.
2. To retain in quarantine all immigrants with other contagious diseases, including venereal affections, a sufficient time for treatment.
3. To return to their homes all persons affected with such contagious diseases as it is impracticable to treat in such way, as leprosy, tuberculosis, and advanced syphilis.
4. To provide for efficient medical inspection at foreign ports of emigration, with the power of arresting importation of dangerous diseases to this country.

 ALOPECIA AREATA FOLLOWING INFLUENZA.

In the *London Lancet* of June 7, 1890, WILLIAMSON records a case of alopecia areata following attacks of influenza. The influenza recurred two months after the first attack, at both of which a severe neuralgia of the supra-orbital and occipital nerves was a prominent symptom or complication. The pain was, in a measure, persistent, and later, after several months, was followed by the appearance of bald patches along the course of the affected nerves. The skin of the patches was sensitive and tender to the touch. Recovery gradually took place.

 HEREDITARY CANITIES.

An interesting example of hereditary canities is reported (*British Medical Journal*, vol. ii. p. 85, 1890) by J. H. MORGAN. From the median line of

only went off, but the mobile portion, driven backward, broke through his incisor teeth and became firmly imbedded in his pharynx, whence it had to be pried out.

LARYNGITIS.

A case of subglottic œdema of the larynx, especially in its posterior portion, after the ingestion of two tablespoonfuls of a 2½-per-cent. solution of potassium iodide, one at noon and the other in the evening, has been reported by DR. ALBERT ROSENBERG, of Berlin (*Deut. med. Woch.*, Sept. 11, 1890). In most cases of œdema of this character the lesion involves the aryteno-epiglottic folds, or the epiglottis.

MYXOMA OF THE EPIGLOTTIS.

In the *N. Y. Med. Journ.*, Sept. 6, 1890, DR. S. O. VANDERPOEL, of New York, reports a hyaline myxoma of the lingual surface of the epiglottis, in association with pernicious anæmia which terminated fatally. The tumor, the bulk of a horse-chestnut, was removed with the electric incandescent snare, and a slight recurrence took place a few weeks later. Dr. Vanderpoel calls attention to the fact that pernicious anæmia and pseudo-leucocythæmia are frequently accompanied by morbid growths in various portions of the body.

NASAL HYDRORRHOEA.

In the *N. Y. Med. Journ.*, Sept. 6, 1890, DR. T. MELVILLE HARDIE, of Chicago, reports two instances of long duration in married German women, forty-three and forty-two years of age respectively; a remarkable coincidence in exemplification of the well-known but little comprehended law of similars. The record is enhanced by an illustrated report by DR. CASEY A. WOOD on the eye-symptoms.

LOOK BEYOND THE NOSE.

This is the title of a paper (*N. Y. Med. Journ.*, Sept. 27, 1890) by DR. SOLOMON SOLIS-COHEN, of Philadelphia, in which he deprecates the too frequent attribution of neurotic maladies to abnormal conditions of the interior of the nose. In exemplification he details a case of periodical headaches said to have been of twenty years' duration, treated ineffectively for some two years by various rhino-chirurgical procedures, and substantially relieved, if not cured, by constitutional measures, mainly the administration of quinine hydrobromide.

A second case is reported of exasperating headaches and occasional insomnia for years, variously attributed to uterine, ocular, and nasal maladies, and ineffectually treated on these lines, but succumbing in great measure to constitutional treatment directed to gastro-intestinal irritation and consequent lithæmia. A third case is mentioned in which a patient has had no reflex disorders and does not know what a headache is, despite a deviated and thickened septum in contact with both middle turbinates, a posterior enlargement of one lower turbinate, and engorgement of the erectile tissue upon both sides of the septum posteriorly.

Resorcin (0.5-5 per cent.) exerted a restraining influence in weakest proportion and absolute in strongest.

Sulphur (0.2-10 per cent.) had no effect whatever.

Cinnabar (1-10 per cent.) had no effect.

Calomel (0.2-10 per cent.) prevented development.

Corrosive sublimate (0.1-1 per cent.) had an absolute influence in hindering growth.

Iodine (0.1 per cent.), no influence; but in proportion of 5 per cent. prevented development.

Tincture of iodine, about the same relatively as iodine.

Iodoform (1-10 per cent.), no effect upon favus fungus, but in strongest proportion had some influence upon the ringworm fungus.

Aristol (0.2-10 per cent.) upon favus fungus negative, and only a limited influence upon the growth of the trichophyton when in the strongest proportion.

Salicylic acid (1 per cent.) was preventive of development.

Salol, in alcoholic solution (0.8-2 per cent.) no influence; but added as a powder (1-10 per cent.) was preventive.

Oil of cade (1-10 per cent.) stopped growth.

Balsam of Peru (20 per cent.) and styrax liquid (20 per cent.) proved destructive.

Alcohol (2 per cent.), no effect; (10 per cent.) slight influence; (20 per cent.) prevented growth.

Aque calcis (1-10 per cent.), no influence.

Sapo viridis (50 per cent.) exerted a preventive action.

The following oils and ointment-bases mixed with the culture-medium in 50 per cent. proportion gave the following results: Olive oil and linseed oil, no effect; simple ointment and benzoated lard, a slight preventive influence; yellow vaseline, a slight effect upon the fungus of favus, and absolute influence upon the ringworm fungus; white vaseline, slight preventive influence; anhydrous lanolin hindered development of ringworm fungus, and apparently, although not conclusively, the same effect upon the achorion Schönleini. [As regards sulphur the writer's results are in opposition to the effect observed in somewhat similar experiments made by Thin a few years ago.—Eds.]

NOTE ON THE DIAGNOSIS, BY MEANS OF THE MICROSCOPE, OF PAGET'S DISEASE OF THE NIPPLE AND BREAST.

MACALLUM has (*The Canadian Practitioner*, October 16, 1890) been able, by examination of sections and crusts from Paget's disease, to confirm the importance of the so-called psorospermie to which Darier and Wickham have called attention. Until the nature of these bodies is better known, the writer suggests the name "endocyte." The diagnosis may, therefore, be made in this disease in the earliest stages by the help of the microscope. In the examination of the crust the following method, which gives a permanent preparation, was employed: The crust, or a portion scraped from the nipple, was teased out in a drop of tincture of iodine on the slide, the cover-glass put on, and, after a couple of minutes, a drop of 50 per cent. glycerin run in. The alcohol and the iodine fix the endocytes, and the iodine gives them a brown-yellow tint, which fades slowly in glycerin.

the scalp toward the forehead a white tuft of hair was present in one or more members of a family for four generations—the maternal grandfather, the mother, the son, and grandchild. In some of the families several exhibited this peculiarity. Another instance, observed by Joynt, is quoted; several brothers, the mother, the maternal uncle and grandfather possessing a somewhat similar white tuft.

THE ABSORPTION OF MEDICAMENTS FROM OINTMENTS.

With this object in view, LUFF has made (*Monatshefte für praktische Dermatologie*, Bd. xi., No. 2) the following preliminary experiments, tending to show that the absorption of different drugs may depend, in a measure, upon the ointment-base employed. The experiments consisted in placing a small quantity of 4 per cent. ointments of iodine, carbolic acid, and resorcin, made up with vaseline, fat, and lanolin, in sheep bladder; these were dipped into beaker glasses containing distilled water, which was slightly warmed (to 98° F.) by being kept in a water-bath. The water was tested at intervals to determine the earliest evidence of the presence of the several drugs. The results were as follows:

Ointment of vaseline and potassium iodide .	evidence in	1 hour.
“ fat “ “ .	“ in	9 hours.
“ lanolin “ “	no evidence in	24 “
“ vaseline and carbolic acid	evidence in	2½ “
“ fat “ “ .	“ in	7 “
“ lanolin “ “ .	no evidence in	24 “
“ vaseline and resorcin .	evidence in	10 “
“ fat “ .	“ in	15 “
“ lanolin “ .	no evidence in	24 “

Luff considers these marked variations due to the physical condition of the ointment-bases employed, and not to any difference in the melting-point, inasmuch as this is about the same—vaseline, 40° C.; fat, 37¼° C., and lanolin, 40° C.

THE INFLUENCE OF MEDICAMENTS UPON THE CULTURE OF THE ACHORION SCHÖNLEINII AND TRICHOPHYTON.

Elaborate and extensive experiments have been made by SCHWENGERS (*Monatshefte für praktische Dermatologie*, August 15, 1890) bearing upon the question of the parasiticide properties of the various drugs upon the favus and ringworm fungi. The different medicaments were mixed in several proportions with the culture-medium, and the fungus of favus or ringworm introduced. After several weeks, examinations were made and effects noted.

The results obtained by the writer may be given as follows:

Pyrogallic acid both in alcoholic solution (0.1–1 per cent.), and added as a powder (0.1–10 per cent.) prevented development.

Chrysarobin in alcoholic solution (0.1–1 per cent.) and added as powder had practically no influence.

Ichthyol, in aqueous, alcoholic, and ether solutions had a positive effect when strength was above 1 per cent., and 10 per cent. (aqueous solution) prevented all growth.

exceed two months. Two of the patients perished, one from hæmorrhage, one from ileus.

Regarding the pathology of the cases, Orthmann feels justified in concluding that a firm organized blood-clot found within a Fallopian tube renders the diagnosis of tubal pregnancy extremely probable. An intra-peritoneal hæmatocele occurring with a tubal pregnancy results either from rupture of the sac of the ovum, or through an abortion of the ovum which had lodged at the abdominal extremity of the tube. The recognition of decidual cells is not a positive proof of a tubal pregnancy. Villi of the chorion can be distinguished in all cases of tubal pregnancy during the early months.

A REMARKABLE CONTINUANCE OF PREGNANCY IN SPITE OF INTRA-UTERINE MANIPULATION.

VICKERY (*Boston Medical and Surgical Journal*, p. 413, 1890) reports the case of a multipara, nursing a child six or eight weeks old, who observed suppression of menstruation. The patient took tansy tea and turpentine without result. An English catheter was then obtained, and daily efforts made for about three weeks to pass it into the womb to interrupt pregnancy. The patient thought that she had succeeded because a constant uterine hæmorrhage resulted. A physician was called, and pregnancy not being suspected, the patient was given ergotin, in all 72 grains, and the vagina was tamponed. As it was supposed that the placenta had been retained from the previous labor, her physician eurented the uterus, and then applied tincture of iodine to the endometrium. Hæmorrhage continuing, a gallon of hot water was injected three times daily for four days. Dr. Vickery, when called in consultation, found the fundus of the uterus near the umbilicus, and pregnancy undoubtedly existing. Labor was then induced, and a five or six months' fetus was expelled. The woman escaped septic infection or any permanent injury.

THE TREATMENT OF POST-PARTUM HÆMORRHAGE.

In a discussion before the Obstetrical Society of Moscow, MURATOW (*St. Petersburg medicinische Wochenschrift*, No. 8, 1890) reported eight cases of post-partum hæmorrhage in which irrigation with a hot solution of creolin failed to check the hæmorrhage. The uterus and vagina were then tamponed with creolin gauze. Pads and a bandage were placed upon the abdomen, by which external compression was made. The tampons and bandages were allowed to remain two days before removal. Good results followed in all cases.

ROSTOWZEW and ALEXANDROW reported thirteen cases treated by tamponing the uterus. In a part of the cases the result was satisfactory. In others great pain was produced, and the insertion of the hand within the uterus was considered a safer and more efficient expedient.

THE PATHOGENESIS OF ECLAMPSIA.

BLANC (*Lyon Médicale*, No. 38, 1890) has studied the blood of an eclamptic patient by making cultures from this blood in sterilized bouillon. After forty-eight hours numerous fine, short bacilli were observed moving rapidly.

OBSTETRICS.

 UNDER THE CHARGE OF

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 A CLINICAL STUDY OF THE URINE OF THE NEWBORN CHILD.

HOCHSINGER (*Wiener medicinische Presse*, No. 41, 1890) concludes an extended study of the presence of indican in the urine of the newborn child as follows: Indican is usually not present during the period of lactation, but a trace of this substance is found in children artificially fed. In breast-fed children indican is entirely absent. Simple dyspepsia and diarrhœa and also habitual constipation in nursing children and young children do not produce this body in the urine. Cholera infantum and chronic diarrhœa result in its formation. When primary intestinal lesions and septic infection are excluded a considerable amount of indican points to the presence of tubercular disease. Children older than nurslings show the same reaction to tests for indican which adults show.

 A STUDY OF THE CONFIGURATION OF THE FŒTAL HEAD.

RUNGE (*Zeitschrift für Geburtshülfe*, Band xix. Heft 1) summarizes his study of the configuration of the foetal head as follows: He considers the existence of a pronounced asymmetry in the skull as caused by labor and occurring in a definite way, as extremely doubtful. The act of labor itself has the greatest part in producing asymmetry of the foetal skull. The great arching of the anterior parietal bone observed in occipito-posterior positions occurs during the act of labor itself, and disappears so rapidly at the completion of labor that a difference of only about a millimetre can be detected. The arching portions of the frontal bone show no especial difference after labor. The sliding of the bones over each other, and also a protrusion or depression of adjacent bony edges is the result of a distinct motion of rotation.

 TEN CASES OF TUBAL PREGNANCY AND THEIR PATHOLOGY.

ORTHMANN (*Zeitschrift für Geburtshülfe*, Band xx. Heft 1) has made a careful examination of the specimens in ten cases of tubal pregnancy upon whom he performed laparotomy. These patients ranged in age from twenty-six to forty-four years. The greater number were multiparæ, and, as a rule, more than a year had elapsed since the previous pregnancy. The presence or absence of menstruation differed greatly in the different cases. As a rule, it was absent, but hæmorrhage at the time when menstruation should have occurred was not infrequent. In five of the cases the pregnancy was in the right; and in five in the left tube. The duration of the pregnancy did not

plete. The decidual layer on the upper surface of the chorion was very thin, and a dark-colored blood-clot was found near the edge of the placenta. An examination of the foetal surface of the placenta showed a lack in its usual amniotic covering. When an effort was made to separate the amnion from the chorion it was found that the amnion was absent, the membranes consisting of the chorion and a thin layer of decidual cells. The placental insertion of the cord was peculiar, because of the presence of a sheath of tissue extending three-fourths of an inch upon the cord. A microscopic examination of the membranes showed a layer of large ovoid decidual cells; next to these a layer of small round cells, and next, connective tissue. Küstner's explanation of the case is that the amnion and chorion became separated at the time when the lifting of the heavy weight occurred, followed by the hæmorrhage during pregnancy. Where amniotic bands adhered to the fœtus amputation followed. Compression of the umbilical cord caused the cyanosis observed at birth. Two similar cases have been reported by Gustave Braun, although the pathology of the cases was not recognized.

AMNIOTIC BANDS AND CONGENITAL AMPUTATIONS.

An interesting study of a case of this sort is reported by THERESE and BROCA (*Bulletins de la Société Anatomique de Paris*, November, 1890, p. 473). Complete amputation at the upper third of the left leg had taken place, the stump not having fully healed. The left hand showed webbed fingers, and to these fingers a long fibrous band was attached. A careful dissection by Broca revealed the skeleton profoundly modified by the amniotic bands which could be in some places detected. The question is raised as to whether these amputations could be instances of ainhum, but there can be no doubt that adherence of the amnion to the fœtus produces these amputations.

NEPHRITIS AND ABORTION.

A case illustrating the pathology of nephritis during pregnancy is reported by GAUTIER (*Revue Médicale de la Suisse Romande*, No. 11, 1890). The case was a multipara aged twenty-seven years, with previous excellent health. Obstinate vomiting occurred early in pregnancy, followed by prostration and dyspnœa with œdema. Albumin was very abundant in the urine. It became necessary to produce abortion, although the secretion of urine was abundant in amount. Granular casts were also present. The induction of abortion was accomplished by introducing tampons within the cervix. Abortion was followed by the extraction of the placenta and the subsidence of all the symptoms. Upon examination the placenta was found cystic, and with sufficient extent of its surface occluded by white infarcts to account for the death of the fœtus before its expulsion. The early appearance of the albuminuria was also a point of interest.

A CASE OF INTRA-UTERINE INFECTION WITH TYPHOID IN A VIABLE CHILD.

ERNST reports (*Ziegler's Beiträge*, Band viii. Heft 1) the case of a viable child born of a mother ill with typhoid, but never nursed by her. On the

Rabbits were inoculated with various cultures from this bouillon, and the first two animals inoculated had albuminuria and were severely affected. Anuria was also present, and both rabbits succumbed after the inoculation. A third rabbit was given an intravenous inoculation of the bouillon, which was not followed by anuria. Two days afterward a second injection of double the quantity of the same material was given. Seven or eight hours afterward the rabbit died in convulsions, having voided a very small quantity of urine which contained much albumin. The kidneys were found intensely congested. The same culture-fluid was then treated with hydrate of chloral, 2 to 1000, and proved harmless when injected. The culture liquids, when set aside and mixed with chloral in various proportions, remained sterile. It was found that 30 to 45 grains of chloral to the quart constituted an excellent antiseptic for the microorganisms inoculated in the blood in eclampsia. The proportion of chloral is 4 to 1000, to destroy effectually these germs.

THE RELATION BETWEEN THE DIAMETERS OF THE CHILD'S HEAD AND THOSE OF THE MOTHER.

SKALKOWSKI (*Archiv für Gynäkologie*, Band xxxviii. Heft 3) finds that the cranium of the child born at term shows a remarkable resemblance to that of the mother, especially as regards the degree of projection of the parietal eminences. The bi-temporal diameter is less proportionately than the corresponding diameter of the mother's head in primiparæ by an inch and three-fourths, the bi-parietal two inches, and the sub-occipito-bregmatic two and a half inches.

OBSTRUCTED LABOR FROM ANTEFLEXION OF THE UTERUS.

MORGAN (*Occidental Medical Times*, p. 571, 1890) reports a case of prolonged labor in which descent of the head failed, apparently by reason of some obstruction. The pelvis was normal. Efforts at delivery by the forceps and by version failed. After labor had persisted until the child was dead, a second attempt at version disclosed excessive anteflexion of the pregnant uterus. The fundus seemed to form a pocket anterior to the patient's abdomen. Descent of the uterus had not taken place, the womb being imbedded or surrounded by fatty tissue and old adhesions. Efforts at delivery increased the flexion, and constricted the fœtus to a greater degree.

A HITHERTO UNRECOGNIZED CAUSE FOR AMNIOTIC BANDS AND ADHESIONS CAUSING AMPUTATION OF THE FŒTAL LIMBS.

KÜSTNER (*Zeitschrift für Geburtshülfe*, Band xx. Heft 2, 1890) reports the interesting case of a multipara who suffered from hæmorrhage continuing for two days, occasioned by lifting a heavy weight at the end of the second month of her pregnancy. She went on to term, however, and was delivered of a living child. On examination, although symptoms of asphyxia were lacking, the child was cyanotic and the eyelids slightly œdematous. This condition disappeared in two days after birth. The hands and feet of the child showed multiple amputations of phalanges. The placenta was of moderate size, and the membranes were extensively torn, but seemed to be com-

fingers introduced within the vagina, and the whole wounded surface thus exposed. The sutures, of silk or silkworm-gut, should be passed a quarter of an inch apart, beginning at the upper angle of the wound and introducing the needle an eighth of an inch from the margin of the tear on the vaginal mucous membrane and bringing it out at the bottom of the rent, at a point much nearer to the operator than the point of entrance, and re-introducing it at the bottom of the tear, and bringing it out on the opposite side at a point corresponding to the original point of entrance. The object of passing the sutures thus is to pull up the floor of the rent as high as possible, for, by the labor, the whole pelvic floor is depressed, and those parts lying in the middle, more so than those at the sides. By means of the sutures thus introduced the tissues at the sides less movable than those in the centre, because of their close attachment to the pubic rami, become the points toward which the depressed centre is raised.

These sutures can be tied at once from above downward, and by this simple arrangement almost the whole wounded area can often be disposed of by as few as three sutures.

Two or three superficial perineal sutures on the outside will finally give a perfect closure, thus restoring the perineum and vaginal outlet to their original integrity.

The after-treatment is of great importance, as there is danger of doing both too little and too much. The general injunction that the patient must lie motionless in the recumbent position, is not necessary. She should be allowed to move very gently from side to side, preventing the knecs from separating widely. Another important detail of the after-treatment is the regulation of the bladder. She should be allowed to pass her water if she can, and if this is impossible, a clean glass catheter should be used every six or eight hours. Before catheterization, the parts should be cleansed, particularly around the urethral orifice, with a piece of absorbent cotton. After the urine has been passed, the labia minora should be gently separated, and any fluid around the orifice of the vagina gently taken up on a piece of absorbent cotton, and some antiseptic powder sprinkled within the vulvar orifice by means of a camel's-hair brush or a pledget of cotton held by a pair of dressing-forceps.

GYNECOLOGY.

UNDER THE CHARGE OF
HENRY C. COE, M.D., M.R.C.S.,
OF NEW YORK.

THE TREATMENT OF RETROFLEXION BY PELVIC MASSAGE.

DÖDERLEIN (*Med. Anzeiger*, August, 1890) has simplified Brandt's method of treating posterior displacement. Having restored the tone of the relaxed uterus in a few *séances*, by stroking the organ in a direction from the fundus

fourth day after birth it became suddenly stupid, was marked with jaundice, and showed a fine exanthem upon the legs and lower part of the body. Death ensued. Upon post-mortem examination, icterus, deep injection of the mucous membrane of the stomach, with excessive enlargement of the spleen, were present. Cultures made from the blood of the heart and spleen in the arteries and Malpighian bodies developed typhoid bacilli. It is probable that a large number of bacilli entered the child's circulation suddenly, and increased in number rapidly.

POST-PARTUM ECLAMPSIA AND ECLAMPSIA CAUSED BY FÆCAL INTOXICATION.

FLESCH (*Münchener medicinische Wochenschrift*, No. 42, 1890) reports a case of a patient delivered, after a tedious labor, by forceps, the bladder being apparently empty before delivery. After delivery a tumor was felt in the left lumbar region which disappeared after friction had been made upon the relaxed uterus. The bladder was then discovered to have filled, and a large amount of urine was withdrawn. Flesch diagnosticated hydronephrosis from compression of the ureter. When the uterus contracted and the pressure was removed the urine suddenly entered the bladder. The eclamptic convulsions which occurred after delivery were caused by the absorption of toxic material from the urine retained in the pelvis of the kidney.

A second case of eclampsia was closely related in etiology, albumin increasing as constipation persisted. Flesch remarks that in scarlet fever the albuminuria increases during constipation, and diminishes when this cause is not present. He treats his cases in accordance with this observation.

LACERATION OF THE PERINEUM AND VAGINAL OUTLET; REPAIR OF THE RECENT TEAR.

ROBB (*Johns Hopkins Hospital Bulletin*, December, 1890) states in regard to the repair of such a laceration, that for the immediate operation, the operator must have plenty of hot water at hand, and an ounce of a ten-per-cent. solution of cocaine, if several days have elapsed; in the latter case, while preparing for the operation, the surgeon should place a pledget of cotton, saturated with the solution, within the vagina, and allow ten minutes to elapse to secure its local anæsthetic action.

The only instruments necessary are a needle-holder, a pair of scissors, and a needle threaded with a loop to carry sutures, and perhaps a spoon to hold up the anterior vaginal wall.

The patient should be brought to the edge of the bed in front of a good light, with her buttocks resting on a perineal pad, which will conduct the water used in cleansing and irrigating the parts, by means of the apron, into a bucket beneath. Upon flexing the knees on the abdomen and separating the labia, a deep ragged rent will appear in the posterior vaginal wall, beginning at the fourchette as an apex and extending up to the columna posterior within, and on the perineal surface down toward the sphincter ani. This is the deepest form of superficial tear, involving neither vaginal sulci nor the sphincter ani without.

To proceed with the operation, the labia should be separated by the two

A second variety forms a firm colloid mass closely related to colloid cancer; a third appears as a watery fluid easily soluble, and found in only a few ovarian cysts. The first variety is a true cell-secretion; the origin of the other two is unknown, though the third may be a product of cell-disintegration. It is evident that, practically, the presence of pseudomucin in fluid withdrawn for diagnostic purposes from an abdominal tumor does not prove that it came from an ovarian cyst, as it has been found in cancerous ascitic fluid.

THE TREATMENT OF ABSCESS OF THE TUBE AND OVARY BY VAGINAL INCISION.

In a recent discussion at the Société de Chirurgie, TERRILLON stated (*Le Semaine Médicale*, No. 28, 1890) that up to 1888 he had treated this condition by vaginal incision and drainage with indifferent success, since which time he had invariably employed abdominal section and extirpation of the diseased adnexa. TERRIER said that he had never been able to see any advantage in vaginal drainage, since, aside from the immediate dangers, a permanent fistula usually resulted, so that the patient was not cured. He recommended laparotomy in every case of peri-uterine suppuration. No matter of whatever origin, elevation of temperature in connection with disease of the adnexa was a sufficient indication for abdominal section. DEPRÈS insisted that a distinction should be made between pelvic abscesses proper and those which had their seat in the ovaries or tubes. He had repeatedly cured pyosalpinx by puncture *per vaginam*; vaginal incision and drainage were, of course, to be recommended only when the abscess clearly pointed in the posterior fornix.

THE MORE REMOTE RESULTS OF REMOVING THE OVARIES AND TUBES.

KELLY (*Johns Hopkins Hospital Bulletin*, 1890) summarizes from his experience in ninety-six cases of salpingo-oöphorectomy as follows: A small percentage of the patients were restored to perfect health within a few weeks after operation, a larger number were eventually restored to comparative health, and a few were no better subjectively after the operation. He adds the following suggestions for avoiding some of the ultimate bad results of laparotomy: 1, as the ligature often remains as a septic focus, it should not be passed through the pedicle of a pyosalpinx as long as there is pus in or about the stump; 2, a large-sized drainage-tube should be used, and should be dispensed with as early as possible; 3, the operator should work deliberately and carefully, handling the intestines as little as possible; 4, the specimen should be carefully inspected before the abdomen is closed, with the purpose of determining if any portion of the ovary or tube has been left behind; 5, the patient ought to remain longer in the hospital, and should be kept under observation for months after the operation.

ENDOTHELIOMA OF THE OVARY.

POMORSKI and VON VELITS (*Zeitschrift für Geburtshülfe und Gynäkologie*, Bd. xviii. Heft 1) each report a case of this rare affection, which is to be

toward the cervix, he seeks to bring it to its normal position of anteflexion by forcing the cervix forward and upward with the finger within the vagina, while the hand upon the abdomen crowds the body of the uterus downward and backward upon the cervix. This forced compression causes an elongation of the shortened posterior wall of the organ. If there is no peri-uterine inflammation considerable force may be employed without giving pain. This method is particularly applicable to cases of retroflexion occurring during the puerperium. The writer reports six cases, in four of which, by daily *séances* of five minutes' duration, he succeeded in restoring the uterus to a position of permanent anteflexion within from two to four weeks.

SARCOMA OF THE UTERUS.

KALTENBACH (*Ibid.*) reported seven cases of this affection, the disease being confined to the corpus uteri in two, to the cervix in three, and involving both cervix and body in two. Between diffuse round-celled sarcoma of the endometrium and fibro-sarcoma, he stated there were many transitional forms. The uterus was extirpated per vaginam in every instance but one, when the organ was so large that it was necessary to adopt the combined method. All the patients made a good recovery, but two had a recurrence within eight months, and in the case of four others a year had not yet elapsed since the operation; one patient was in robust health at the end of two years and a half. Their ages varied from twenty-five to forty-seven. Recurrence took place in the form of metastatic nodules within the abdomen. In an eighth case (that of a girl, *æt.* fifteen), in which supra-vaginal amputation was performed there was metastasis in the retro-peritoneal glands. In a ninth inoperable case the patient had formerly had a placental mole removed, which seemed to confirm Leopold's observation that sarcoma of the corpus uteri might originate from adherent portions of myxoma chorii, which latter Virchow regards as a true neoplasm.

REDUCTION OF CHRONIC INVERSION OF THE UTERUS BY HYDROSTATIC PRESSURE.

NEUGEBAUER, Sen., (*Ibid.*) contends that this is the ideal way of reducing chronic inversion, supporting his opinion by a case of two years' standing, in which reduction was effected in nineteen days by means of a rubber bag which was gradually distended with water. The patient suffered no pain, and learned to fill and empty the bag herself when it was necessary to relieve the pressure upon the urethra. The writer considers this as the safest and least painful, although it may be the slowest, method of reduction.

PSEUDOMUCIN IN OVARIAN CYSTS.

In an elaborate paper with this title PFAUNENSTIEL (*Archiv für Gynäkologie*, Band xxxviii. Heft 3) makes a contribution to the study of the chemistry of cyst-contents. He concludes that there are several varieties of pseudomucin, which resemble mucin in setting free sugar when treated with acids, but differ from it in their behavior with acetic acid. The most common variety is the tenacious pseudomucin found in proliferous adenocystomata.

normal ovaries. 2. The germ-epithelium retains its normal appearance longest in cysts that are undergoing cancerous degeneration. 3. Ingrowths of germ-epithelium do not arise by active proliferation of the epithelium. 4. The follicles may form irregular spaces lined with a single layer of cells. 5. The epithelium lining the primary and ripe follicles may form epithelial pouches which subsequently become shut off and form new cysts. 6. During the early stages of degeneration of the follicles the ovum is still visible. In short, epithelial growths of the ovary may originate from follicular epithelium, as well as from ingrowths of germ-epithelium.

THE ANATOMY OF THE NORMAL ENDOMETRIUM.

BOLDT read (*Med. Anzeiger zum Centralblatt für die Ges. Med.*, August 30, 1890) a paper on this subject at the recent International Medical Congress in which he sought to prove that the utricular glands, both in the cervix and in the body, are surrounded by interlacing muscle-fibres, which are continuous with both the muscle-bundles of the uterine wall and with those traversing the lymphoid tissue of the mucous membrane. This periglandular muscular layer is developed most richly at the junction of the mucosa and muscularis mucosæ, and extends along the glands up to their mouths. The natural inference is that by their contraction the fibres assist in discharging the natural secretion of the gland.

THE BACTERIOLOGICAL EXAMINATION OF PELVIC, TUBAL, AND OVARIAN ABSCESSSES.

BOISLEUX (*Ibid.*) from a careful study of forty-two cases arrives at the following practical conclusions:

1. The escape into the peritoneal cavity of pus from diseased tubes, or abscesses, should always be carefully guarded against.
2. The amount of such virulent pus which escapes is of no importance, since a small quantity is as dangerous to the patient as a large quantity.
3. If this accident occurs the operator should not be satisfied with irrigating the cavity with sterilized water, but should use some weak antiseptic, such as would cause the least possible irritation of the peritoneum. Cauterization of the pedicle after removal of a pus-tube, and packing pelvic abscesses with iodoform-gauze are efficient means for preventing infection.

INTRA-UTERINE GALVANIZATION A SCIENTIFIC ERROR.

In a paper with this title (*Ibid.*) DANIOU attacks Apostoli, affirming that the constant current does not have a general caustic action, since the electrode comes in direct contact with only a few points on the mucosa. He cites in support of this a fatal case of Apostoli's in which a current of over 100 milliamperes had been used several times, and yet at the autopsy no evidence of any caustic action was found within the uterus, except at the os internum. With regard to galvano-puncture, it was urged that the finer the needle employed the more marked was the result obtained, which in itself appeared to be a contradiction. The writer's own method of applying electricity was by means of a tampon of sponge (*tampon électrique*) which was almost entirely

regarded histologically as angio-sarcoma, developing from the walls of the capillaries. Eight cases in all have been reported by German authors, the first by Leopold.

Case I.—The patient, who was forty-nine years of age and had reached the menopause sixteen months before, applied at Martin's clinic complaining of severe pain in the right iliac region. She was found to have an ovarian tumor which was removed with considerable difficulty, the patient succumbing on the third day. The growth was at first regarded as carcinomatous, but on careful microscopical examination it was pronounced to be an "endothelioma lymphaticum."

Case II.—Professor Tauffer, of Buda-Pesth, operated upon a virgin, æt. twenty-four, who had had a tumor nine years, the size of a man's head. It sprang from the left ovary and was so firmly adherent that the patient did not survive the shock of its removal. Microscopically it proved to be an "endothelioma cysticum myxomatodes."

THE CONDITION OF THE ENDOMETRIUM IN CANCER OF THE CERVIX.

SAURENHAUS (*Zeitschrift für Geburtshülfe und Gynäkologie*, Bd. xviii. Heft 1) has made careful microscopical studies of cancerous uteri with the view of verifying Abel's statement that the corporeal endometrium in cases of cancer of the cervix undergoes sarcomatous degeneration. He examined fifty uteri which had been removed *per vaginam* from the living subject, the disease being confined to the portio-vaginalis in twenty-two, and the cervix being involved in twenty-eight. He was unable to find any evidence of sarcomatous degeneration of the corporeal endometrium, or, in fact, any evidence of malignant changes. The microscopical appearances were those seen in ordinary hyperplastic endometritis. Spindle-cells were uniformly present, but always in the vicinity of the hypertrophied glands. [As the writer aptly concludes, these careful and exhaustive observations destroy an argument in favor of total extirpation of the uterus for cancer of the cervix, as opposed to high amputation, upon which considerable stress has been laid, viz., that even when the disease is limited to the portio-vaginalis, the corporeal endometrium may have already undergone malignant degeneration. We have been able to demonstrate to our own satisfaction, from an examination of twenty cancerous uteri, that there is nearly always present a marked degree of hypertrophy of the corporeal mucosa which might readily be mistaken for a malignant growth. Since the uterus is uniformly enlarged and congested in connection with carcinoma of the cervix, hyperplastic endometritis would naturally be present, as in cases of subinvolution and myofibroma. Pathological observations, in order to be of practical value, must be absolutely unbiassed. It is fatal to the worker in the laboratory to be too strongly tinged with surgical enthusiasm.—ED.]

THE ORIGIN OF EPITHELIAL GROWTHS OF THE OVARY.

STEFFECK (*Zeitschrift für Geburtshülfe und Gynäkologie*, Band xix. Heft 2) concludes an elaborate article on this subject with the following deductions: 1. Ingrowths of the germ-epithelium are observed only in tumors, never in

ing a certain reserve as to prognosis. The prognosis of ordinary pneumonia in children is always favorable, while that of tuberculous pneumonia is uniformly bad.

SALOL IN THE GASTRO-INTESTINAL DISEASES OF CHILDREN.

In the treatment of these disorders, DROIXHE found (*Journ. d'Accouchements*, February 28, 1890) that salol administered by the mouth is unchanged until it reaches the intestine and is acted upon by the pancreatic secretion. It is then decomposed into carbolic and salicylic acids. Barr reports thirty-five cases of gastro-intestinal inflammation which were treated with this agent. In cases in which there was acute gastro-enteritis with vomiting and copious offensive stools salol was efficacious. If the stools were lumpy and the vomit mixed with bile calomel gave better results than salol. With the serous stools of dysentery and colic, opium should be combined with salol to allay the tenesmus. Salol was found efficient in the first period of acute gastro-enteritis and the chronic forms of entero-colitis. The dosage was three centigrammes for children under six months of age, three to nine centigrammes for those of sixteen to eighteen months, and twelve centigrammes for those who had passed the second year. The drug is easily given, and is without toxic action. It is an approved intestinal antiseptic, ranking with naphthol, naphthalin, bisulphide of carbon, and Belloc's charcoal. It may be combined with saccharate of cannella in the treatment of cholera infantum. Locwenenthal used it to prevent the proliferation of the bacillus of cholera and the formation of toxine, which is produced by contact of the bacillus with the pancreatic secretion, in the presence of peptonized albuminoids. Experiments were made by this author upon mice, infected material being injected into some of them without salol, and into others with salol. The former became very sick or died, while the latter were unaffected.

ICTERUS NEONATORUM.

NEUMANN (*Virchow's Arch.*, exiv. 3), in earlier publications, has shown that in icterus neonatorum the biliary coloring-matter distributed through the blood, the transudations, and the tissues, has a tendency—post-mortem—to take a granular and crystalline form. For the investigation of this subject, one may take a small piece from the great omentum and spread it out under the microscope. A little dilute acetic acid being added to break up the red corpuscles, one may see the fat cells crammed with bilirubin granules, pigment-needles being absent. In fetuses which die during or immediately after birth, traces of bilirubin may usually be found. In eight cases the pigment-formation was limited to the fatty tissue, including the greater omentum, the subserous tissue of the parietal peritoneum, the capsule of the kidneys, the pericardium, and the mediastinum. In these cases there was no question about the conversion of the blood coloring-matter into biliary coloring-matter, as is the rule in fetuses which have died *in utero*. In cases in which biliary coloring-matter is present, and in which the imbibition of bile from the surrounding tissues can be excluded, there is often sufficient biliary coloring-matter in the blood to give the skin an icteric color, though the children might have been normal at birth in other respects. If it were

covered by rubber. This he saturated with salt water, applied to the portio vaginalis, and passed through it a current varying from 70 to 150 milliam-pères for not longer than six minutes, when the current was reversed, and this was repeated two or three times. The advantages claimed for this method of application over the intra-uterine were absence of pain, rapid diminution in the size of the growth, checking of hæmorrhage (without recurrence, as was noted after intra-uterine galvanization), relief of pain, and, above all, absolute safety. He had practised his method 2000 times without a bad result, whereas, in Paris, the average mortality with intra-uterine galvanization was at least 5 or 6 per cent. [This attack upon Apostoli seems to us to be at once unjust and uncalled-for. The writer appears to be influenced by some personal animosity which prevents him from viewing the subject in a broad and scientific spirit. The work of Apostoli is too well established to be shaken by such attacks, and his statistics alone are a sufficient reply to his detractors.—ED.]

PÆDIATRICS.

UNDER THE CHARGE OF

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A. F. CURRIER, M.D.,

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AND

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PNEUMONIC FORM OF TUBERCULOSIS IN CHILDREN.

According to HUTINEL (*Rev. Mens. des Mal. de l'Enf.*, June, 1890), in the acute form of tuberculosis in children the apices of the lungs are frequently uninvolved, tubercles being generally disseminated throughout the remainder of the organs. A very interesting form of tuberculosis is that which presents the appearance of pneumonia. In a case of this character there was malaise for fifteen days with slight elevation of temperature. Eight days later there were loss of appetite, vomiting, and cough. Physical examination showed dulness in the supra-spinous fossa, murmur, and bronchophony—in a word, there were signs of pneumonia in the superior lobe of the lung. Defervescence followed, but the tongue remained dry, the general condition was bad, and the temperature rose. Tuberculous pneumonia was diagnosed, and in a few days the child died with phenomena of meningitis. The autopsy showed extensive caseous pneumonia. In children, a pneumonia which has not resolved by the eighth day is almost always tubercular in character.

In a second child, who had been sick only three days, there were signs of pneumonia at the apex, but there were also cavernous râles at the apex, rough breathing, and fever to an unusual degree. Tuberculous pneumonia was diagnosed, and this diagnosis was subsequently found to be correct.

Such possibilities must be remembered in treating pneumonia, thus allow-

stomach, even in the newly-born. The contents of the stomach being removed at varying periods after eating, it was found that actual peptonization of the albumin took place, though only to a very slight degree. Notwithstanding the want of free acid in the stomach, very many of the germs taken with the food are destroyed in the process of digestion. The pathological questions pertaining to this subject were studied in the examination of one hundred and four infants who suffered from acute dyspepsia, cholera infantum, or chronic gastro-enteric disease. In all cases it was found that the milk remained in the stomach an abnormally long time, owing to deficient motor function in the muscular structure of the organ. Marked acidity was present in many cases, as the result of the formation of abnormal organic acids or the excessive secretion of hydrochloric acid in consequence of the irritated condition of the stomach. Pepsin and lab-ferment were found in all cases. It was considered a fair conclusion that by removing the decomposing matter from the stomach, preferably by irrigation, a cure would result in many cases of acute and chronic disease. Very good results were obtained by the author in cases of acute dyspepsia with constant vomiting, also in simple or severe diarrhœa. In cholera infantum the results were less satisfactory.

Corrigendum.—On page 57 of the January number of the JOURNAL, on 16th line from the bottom, for Dr. Hahn *Dr. Kuhn* should be substituted; on third line from bottom, for salt bags, read *ice bags*.

Note to Contributors.—All contributions intended for insertion in the Original Department of this Journal are only received *with the distinct understanding that they are contributed exclusively to this Journal*.

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All communications should be addressed to

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only possible to demonstrate in the blood of the umbilical cord, in children born alive, the presence of biliary coloring-matter, we should have a clue to the proof that icterus neonatorum is a consequence of certain misdirected physiological processes of foetal life; but as yet no one has been able to do this.

NEPHROTOMY FOR TUMORS IN CHILDREN.

FISCHER performed (*Jahrb. f. K.*, xxxi. 1 and 2), between 1873 and 1883, ten operations upon children for the removal of renal tumors. The operation was fatal in eight of the cases, and the disease recurred in one of the remaining ones in nine months, and the other in a year and a half. Six nephrotomies were performed between 1883 and 1889 upon children, one dying from the operation and five from recurrence of the tumor. From 1873 to 1888 thirty-one nephrotomies were performed on children, four being incomplete on account of serious complications. The tumors in two cases were non-malignant, one patient dying, the other recovering. Of twenty-five operations in which there was malignant disease, death occurred in one case from hæmorrhage, and in nine from shock, vomiting, carbolic-acid poisoning, or intestinal paralysis; in seven others death was occasioned by recurrence of the tumor. There were nineteen cases of sarcoma, one of encephaloid cancer, one of adeno-sarcoma, one of myxo-sarcoma, one of carcinoma, two of spindle-celled sarcoma, one of alveolar sarcoma, one of myo-sarcoma, three of round-celled sarcoma, and two of spindle- and round-celled sarcoma. The right kidney was diseased in eight cases, and the left in five. The ages of the children varied from eleven months to eleven years. All operations upon children under two years of age were fatal. Of the intra-peritoneal operations, 52 per cent. were fatal; of the extra-peritoneal, only 10 per cent. Contra-indications to the operation are great weakness, absence of one kidney, disease of both kidneys, very large tumors, and metastatic deposits. Life may be prolonged by the operation, which will be of value according as it is done early in the history of the disease.

THE FUNCTIONS OF THE NORMAL AND THE DISEASED STOMACH AND THE THERAPEUTIC RESULTS OF IRRIGATION OF THE STOMACH DURING INFANCY.

LEO experimented (*Jahrb. f. K.*, xxxi. 1 and 2) with thirty infants ranging in age from two hours to twelve months. An hour to an hour and a half elapsed before the removal of the contents of the stomach in breast-fed children in the first few months of life; with older children fed with cow's milk the time was two hours. The food contents of the stomach being removed, there still remained a small quantity of yellowish fluid which showed all the characters of the secretion of the stomach. It was regarded as the residuum from the digestive process. Fifteen minutes after milk was taken there was found a weakly acid reaction to the withdrawn fluid. Within an hour free hydrochloric and lactic acids were discovered. The hydrochloric acid is at first taken up by the milk as soon as it is secreted, part of it being neutralized, and part entering into acid combinations. Albumin-digesting ferment and lab-ferment were always demonstrable in the full or the fasting

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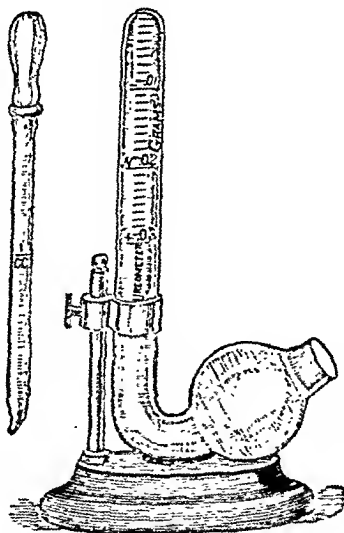
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DISEASES OF THE URIC ACID DIATHESIS.

LAMBERT'S

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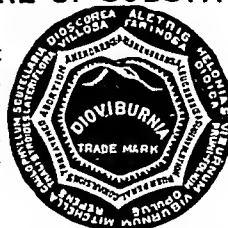
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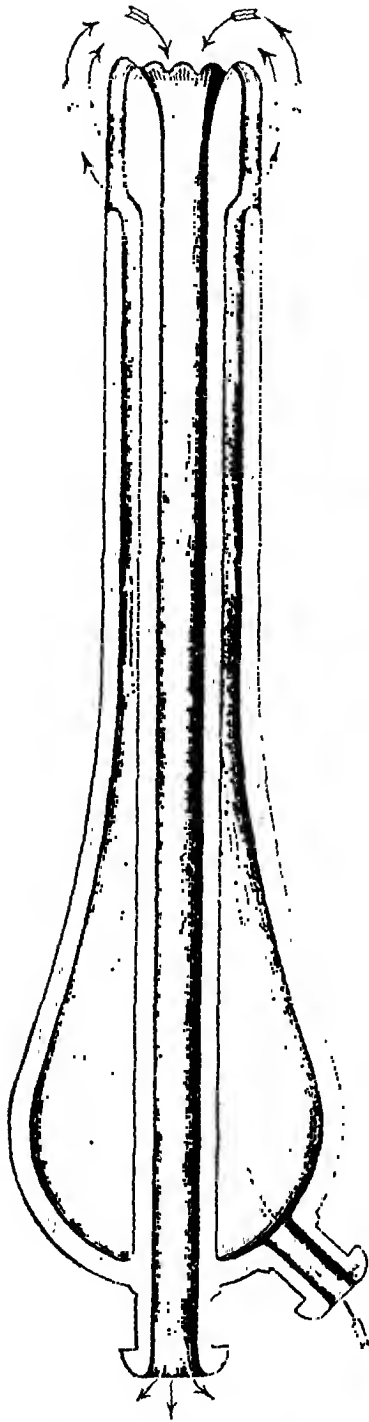
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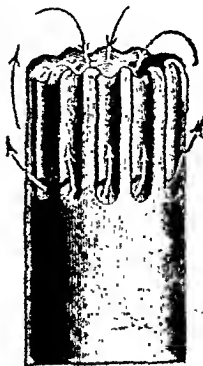
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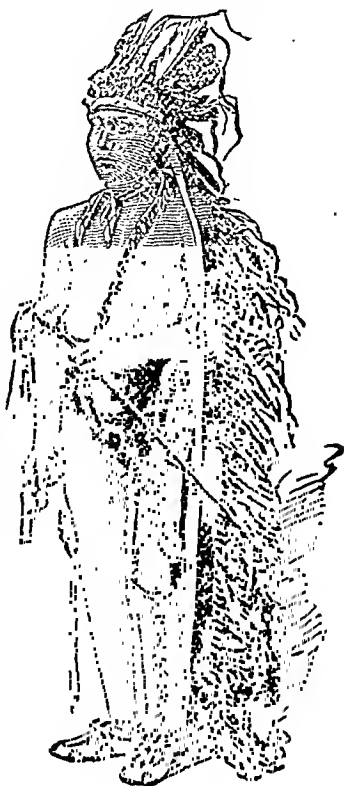
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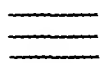
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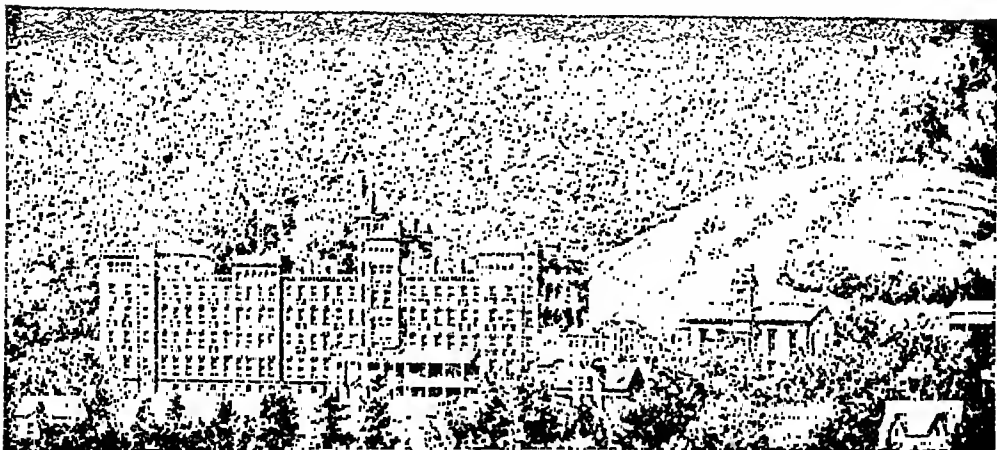
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	PAGE		PAGE
Treatment of the Larynx in Tuberculosis	307	Primary Tuberculosis of the Pharynx	310
Spontaneous Recession of a Laryngeal Papilloma after Tracheotomy	308	Withdrawal of a Needle from the Trachea through the Natural Passage	310
Carcinoma of the Larynx	309	Intubation in Syphilitic Stenosis of Larynx	310
Rhino-pharyngeal Myxoma at Six Years of Age	309	Paralysis of the Larynx	311
Stenosis of the Larynx from Foreign Body without Characteristic Symptoms	309	Unilateral Paralysis of the Abductors of the Larynx	311
		Laryngectomy	311

DERMATOLOGY.

Histology of Tuberculous Skin after Injection with Koch's Fluid	312	Relation of Lupus to Tuberculosis	313
Koch's Fluid in Dermatology	312	The Seborrhœic Wart	313
		Some of the Rarer Effects of Pediculi	314

OBSTETRICS.

Cæsarean Section at the Rotunda Hospital, Dublin	314	Death from Latent Heart Disease	317
The Cæsarean Operation	315	Ovarian Gestation	318
Meningeal Hæmorrhage in the New-born	315	Tubal Pregnancy with Rupture at an Early Stage	318
Treatment of Placenta Prævia	315	A Case of Ectopic Gestation with Operation at the Ninth Month	318
The Intra-uterine Tampon after Placenta Prævia	316	The Proteids of Milk	318
Rupture of the Membranes Twenty-five Days before the Birth of a Living Child	316	The Causes and Treatment of Post-partum Hæmorrhage	319
Puerperal Endocarditis and its Pulmonary Complications	316	Polyuria during Pregnancy	320
A Second Tubal Gestation Diagnosed and removed before Rupture	316	Spontaneous Delivery in a Case of Parietal Presentation in a Small Pelvis	320
The Treatment of Syphilis during Pregnancy	317	Two Cases of Incomplete Breech Presentation, with the Use of Forceps	320
Recent Results from the Study of Labor by Frozen Sections	317	Rigidity of the Cervix Uteri during Labor Necessitating the Application of Forceps	321
		The Caustion of Placenta Prævia	321

GYNECOLOGY.

The Electrolysis of Uterine Fibromyomata	321	Electro-therapy in Gynecology	322
The Technique of Operations for Vesico-vaginal Fistula	322	The Galvanic Current in Gynecology	323
		Treatment by Apostoli's Method	324
		Drainage after Laparotomy	324

PÆDIATRICS.

Invertin Ferment in the Animal Organism	325	Stomach-digestion in Infants	326
Sterilized Milk and its Use in Nourishing Children	326	The Mechanism of Respiration in the Newborn	327
		Diabetes Mellitus in Children	328

CONTENTS.

ORIGINAL COMMUNICATIONS.

	PAGE
Sensory Aphasia—Word-blindness with Hemianopsia. By WILLIAM OSLER, M.D.	219
Unusual Complications in Enteric Fever. By JAMES FINLAYSON, M.D.	224
Disease of the Mid-brain Region. By B. SACHS, M.D.	233
Penetrating Gunshot Wounds of the Abdomen. By WILLIAM B. COLEY, M.D.	243
Anatomy and Physiology of the Faucial Tonsils. By EUGENE HODENFYL, M.D.	257
Why the Sputa of Tuberculous Patients should be Destroyed. By ARTHUR K. STONE, A.M., M.D.	275

REVIEWS.

A Manual and Atlas of Medical Ophthalmoscopy. By W. R. Gowers, M.D., F.R.S.	280
A Contribution to the Study of Psorospermiosis and Paget's Disease. By Dr. Louis Wickham	282
Epilepsy: Its Pathology and Treatment. By Hobart Amory Hare, M.D., B.Sc.	284
Hygiene and Public Health. By Louis C. Parkes, M.D., D.P.H.	286
The Essentials of Medical Chemistry and Urinalysis. By S. E. Wood, A.M., M.D.	287
Mineral Springs and Health Resorts of California. By Winslow Anderson, M.D.	288

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

	PAGE		PAGE
The Therapeutics of Epilepsy	289	Preparation of Saccharin	291
Anæsthetics in Natural Labor	289	Chloroform and Phthisis	291
Experiments upon the Action of Chloroform and Ether	290	Treatment of Dysentery	292
Treatment of Ingrown Nail	291	Treatment of Dysentery	292
		Sulphonal in Diabetes	293

MEDICINE.

The Secretion of Hydrochloric Acid in the Stomach during Digestion	294	The Diagnosis of Abscess of the Liver	295
--	-----	---------------------------------------	-----

SURGERY.

Surgical Tuberculosis Treated by Koeh's Method	297	Treatment of Perityphlitis	302
Tuberculosis and Pseudo-tuberculosis	301	Laparotomy for Gunshot Wound	302
Microorganisms of Suppuration	301	Renal Disease following Gonorrhœa	303
Hernia through the Foramen of Winslow	301	Plate for Intestinal Anastomosis	303
		The Management of Damaged Bowel in Strangulated Hernia	303

OTOLOGY.

Post-mortem Examination of the Ear in a Case of Acquired Deaf-dumbness	304	Chronic Circumscribed Inflammation, with a Polyp in the External Auditory Canal, the Result of Pressure from a Wax-plug	306
Two Cases of Necrosis of the Cochlea	305	Influenza-otitis	306
Ossification of Membrana Tympani	305		

with him, beyond slight headache; but it was noticed that he had occasional difficulty in getting the word he wished, and this circumstance led to a more careful examination. He says he has been a temperate man, and has always enjoyed excellent health. He has not had syphilis. For some time past he has not felt as well as usual. On November 1st, while at his supper, in a restaurant, he found that he could not read the daily paper. He was sure that this came on quickly, and had been his chief annoyance, as he was an ardent politician. He had no definite headache, but complained of a diffuse, uneasy sensation, and sometimes placed his hand upon his head saying, "It is all wrong here."

Present condition: Vigorous-looking man for his age; face intelligent; speaks clearly and rapidly, with occasional interruptions; no paralysis; movements of the arms, legs, and face perfect; no loss of sensation on either side; no incoördination; he stands well with his eyes shut; reflexes normal.

Speech: Though he speaks clearly and intelligently, and utters some sentences without interruption, replying promptly and fluently to questions, and evidently understanding everything, there is very distinct speech-disturbance; thus, for some time he could not give the address of his residence. He says he knows where it is, but could not pronounce it. He told the first name of the man with whom he lived, but could not say the second. He could not name his own occupation, but said, "Keep, keep, keep. Oh, you say it for me." When told—bookkeeper—he repeated it distinctly. He occasionally misplaces words. In referring to a wetting which he had spoken of, he said, "Deliberate attacks of wet dress." When a printed or written page is presented to him he does not appear to comprehend the words. The word Philadelphia at the head of a hospital blank, he read P, r, i, n, g, r, e, k. When told that it was Philadelphia, he replied, "Oh, certainly it is, I've known it for sixty-five years." His age, 72, written on a slip of paper, he read 213. He did not recognize the words "Cleveland and Harrison" at the top of a newspaper column, but when read to him, said, "I know all about them," and began making some very shrewd observations. He can write his name, but says that since his failure to see he does so with difficulty. He writes as well with his eyes shut as when they are open, but does so with hesitation. He wrote the name of the hospital, and the words "Philadelphia Record." He could not read the words of his name after he had written them. He names objects held before him quite readily.

Dr. de Schweinitz examined the eyes, and reported the presence of right lateral homonymous hemianopsia. Dr. de Schweinitz's report is here annexed:

Right eye: An oval optic disk, with the scleral ring plainly followed all round, and both superficial and deep layers very gray; the veins full and dark, the arteries unchanged in size; a fine retinal haze veiled the upper and lower margins of the disk; there were no splotches or hæmorrhages in the general eye-ground, and no changes in the macular region.

Left eye: An oval optic disk, with well-marked scleral ring, more visible than on the opposite side, because the retinal haze seen in the opposite eye was less apparent. A similar appearance of the retinal circulation and an absence of gross changes in the retina and choroid;

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MARCH, 1891.

A CASE OF SENSORY APHASIA—WORD-BLINDNESS WITH
HEMIANOPSIA.

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THIS case illustrates the following points: (1) The association of word-blindness with disease in the parieto-temporal region; (2) The paraphasia which so often accompanies this condition; (3) The occurrence of hemianopsia from interruption of the fibres of the optic radiation, without disease of the occipital lobe.

CLINICAL SUMMARY.—*Inability to read a newspaper the first symptom; typical word-blindness, retention of intelligent hearing; misplacing of words and sentences—paraphasia; right homonymous hemianopsia; no paralysis; persistence of this condition for over two months, with gradual loss of muscular strength and mental power. For thirty-six hours before death, paralysis of right arm and leg.*

ANATOMICAL SUMMARY.—*Necrotic softening in the left hemisphere of the supra-marginal and lower part of angular gyri, of the posterior part of the first and second temporal, and of the two annectant convolutions uniting the first temporal to the parietal lobe. Complete transverse softening of the white matter between these convolutions externally and the lateral ventricle. The gray and white matter of the occipital lobe uninvolved.*

John W., aged seventy-two years, Scotchman, bookkeeper, applied at the Philadelphia Infirmary for Diseases of the Nervous System, November 14, 1888, complaining of uneasy sensations in his head. He was a healthy, vigorous-looking man, perfectly intelligent, and spoke well and clearly. It was not thought at first that there was anything the matter

On the 12th the note was: "Remains in the same condition; no fever; no paralysis; talks without difficulty; answers some questions correctly, others in a senseless manner. Says continually 'Lord, have mercy.' No disturbance of sensation."

On the 15th the note was: "Has been very wakeful for the past two days. This morning could not be roused. He lies with his head turned to the left, but sometimes moves it to the right. No conjugate deviation of the eyes. Pupils equal and of medium size; react feebly to light. Muscles of the right side of face seem to act as well as those on the left. There is complete paralysis of the right arm, which has come on within the last twenty-four hours. He moves the right leg, but when lifted it falls more rapidly and with more dead weight than the other. He is in a semi-comatose condition. There are loud bronchial râles." He sank and died on the afternoon of the 16th.

Post-mortem, five hours after death: Body moderately well-nourished; no rigor mortis; calvaria thick and symmetrical.

Dura was normal and very closely adherent to the skull; sinuses contained recent blood-clots; a moderate amount of fluid escaped on removal of the brain. At the base the membranes were normal. The carotids were stiff and atheromatous; vertebral and basilar arteries in the same state. Nerves at the base normal.

Cortex: Pia moderately injected; the posterior part of the left hemisphere looked fuller and the convolutions were paler than on the right side. This was particularly marked on the parietal and temporal lobes, portions of which look softened. More accurately determined by sight and touch, the superficial soft areas were as follows:

1. The entire supra-marginal and the lower part of the angular gyri.
2. The posterior part of the first and second temporal gyri, which bulge distinctly, and the veins of which are much distended.
3. The two annectant convolutions joining the first temporal gyrus and the parietal convolutions, only evident after separation of the fissure of Sylvius.

Though these parts were softened and contrasted by touch, in a marked manner, with the rest of the brain, superficially they did not look very different, and were only a little paler in color.

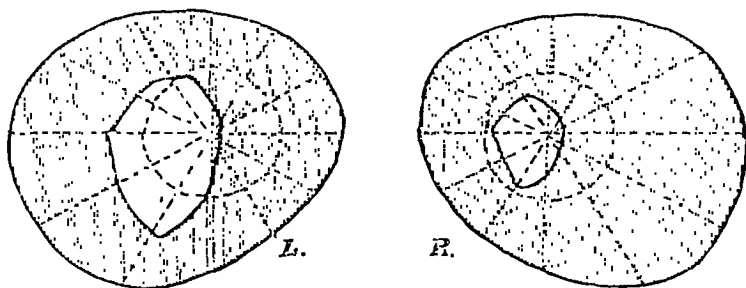
The cortical arteries were stiff, and when slit open were found free to the finer ramifications. They presented occasional flakes of atheroma and recent soft blood-clots, but no thrombi. The posterior cerebrals presented several atheromatous patches. The branches passing to the cuneus were free. The lateral ventricle was not distended on the left side. The caudate nuclei and thalami looked normal. On the outer wall of the left ventricle, just at the point of divergence of the descending and posterior cornua, there was a grayish-white swelling, presenting congested bloodvessels here and there, and which looked like a region of thrombotic necrosis; behind, it extended into the posterior horn, anteriorly it did not reach the pulvinar. The ependyma of the posterior horn was soft, but the deeper white matter of the lingual gyrus and of the convolution at the junction of the parieto-occipital and calcarine fissures was not involved to any depth.

The organ was injected with and hardened in Müller's fluid, and then horizontal sections were made.

Section 1, half an inch above the corpus callosum.

the disk was also gray, but not so devoid of color and capillarity as that upon the opposite side.

FIG. 1.



The oval outline of each figure is the average normal field of vision; the shading represents the blind areas. The asterisk is the fixing-point which is not exactly bisected by the line of division, but this passes a little to the right, although touching the fixing-point. There is decided contraction of the left half of each field, most marked upon the right side; that is, upon the side opposite to the lesion. The fields were taken with a one-centimetre square of white, pasted upon a dead black surface.

November 21, 1888. Patient was admitted to hospital with no essential change in his condition, though he did not seem to misplace words so often. He could not say his age, 72, but said "60 and 10 above that and 2 above that—that's 72." He knew the day of the week and of the month, and what year it was. He was asked how many years after Burns's death he was born, and said 5000, but at once corrected himself and said "No, no; I do not mean that—twenty-five." The state of word-blindness persisted. He was given a newspaper, the *Philadelphia Record*, and asked to read its title. He said "Christian Observer." It was difficult to get him to write, and it was impossible for him to do so from dictation for any lengthy sentence. He wrote the word "Record" when told to, but after he had written it he spelled it "Freedom."

For the first two weeks in hospital there was no special change. He seemed to speak with rather fewer errors. He kept very quiet, and did not care to talk with the other patients. When asked how he felt, he generally placed his hand upon his head and repeated several times the phrase "All wrong here."

December 6. For several days he has vomited frequently.

8th. The following note was made: "Talks less freely. Speaks intelligently and plainly at first, but after a few minutes it is difficult to understand what he states. No additional ocular changes. The grip in the hands is equal. He walks with a somewhat tottering gait, though there is no actual paralysis."

For the next three weeks the condition remained practically unchanged. Early in January he became distinctly weaker.

On the 4th the following note was made: "Patient has been in bed for several days; no paralysis of motion or of sensation. He seems to understand and usually answers correctly, though, as was frequently noted, he would not give his age correctly, saying any figures. When first spoken to, his speech is clear and distinct, and then in a few minutes becomes very incoherent and mumbling. Lately he has been very noisy and restless at night, getting out of bed and walking about the ward."

The softened area has a grayish-yellow appearance, interspersed with patches of extravasation. It appeared to be ordinary necrotic change. The vessels were carefully withdrawn; no miliary aneurisms were found, but many of the smaller ones were blocked with thrombi. At the lower part of the temporo-sphenoidal lobe the margin of softened area was unusually firm. The branches of the posterior cerebral artery were free.

The drawing was made from a section which passed through the lower portion of the supra-marginal gyrus, at half an inch from the termination of the Sylvian fissure. The softening here was more superficial than at any other point, and seemed to involve the gray matter. In the posterior part of the first and second temporal the softening reached to the gray matter, but did not enter it. In the section from which the drawing was taken a deep fissure is seen, which crossed the hemisphere, and seemed to separate the parietal and occipital lobes. The angular gyrus lies at a higher level than shown in the section; the white matter of it was softened, but the gray looked very natural. The drawing is an exact representation of the specimen, made by placing tracing-paper upon the section.

UNUSUAL COMPLICATIONS IN ENTERIC FEVER.

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I.

. ABORTIVE ATTACKS, OCCURRING IN FEVER EPIDEMICS, NOT FREE FROM DANGER.

IN outbreaks of infectious disease in institutions, or otherwise affecting special groups of people, it is not uncommon to find a certain number of abortive attacks, or of obscure and indefinite illnesses, the nature of which can only be recognized in view of the circumstances under which they occur. In the unfortunate outbreak of enteric fever amongst the nurses, servants, and patients of the Glasgow Western Infirmary which occurred in August, 1884, the infection was traced with complete precision to contaminated milk. (*See Report by the Medical Officer on Outbreak of Enteric Fever in Royal and Western Infirmaries, and Fever Hospital, Belvidere, Glasgow, in August, 1884: Glasgow, 1884.*) In this outbreak we had various illustrations of these abortive attacks—slight febrile attacks for two or three days, with complete recovery. Unfortunately, however, we had one case, apparently the most trivial of the whole group, which subsequently proved fatal. This girl, a housemaid,

The white matter of the centrum ovale on the left side presented a slight reddish-brown color in the fibres of the parietal lobe.

Section 2, at level of the corpus callosum.

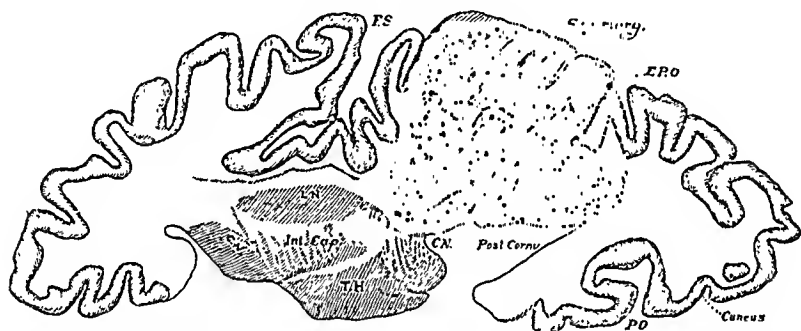
An area of softening in the posterior-external part of the centrum ovale of about four centimetres in antero-posterior extent. Externally, this section passed through the angular gyrus, the gray matter of which was firm, but the white matter was uniformly softened.

Section 3, at the level of the middle of the basal ganglia.

The softening occupied a large area between the posterior horn and the middle of the outer aspect of the hemisphere, involving the entire white matter of this region (see figure). Anteriorly it reached to the posterior part of the internal capsule, which appeared somewhat softened but not changed in color. Posteriorly, the softening did not extend behind a line drawn across the level of the parieto-occipital fissure. The white matter of the occipital lobe was firm, and the gray matter of the cuneus was uninvolved.

Section 4, passing through the outer third of the left crus.

FIG. 2.



Transverse section of left hemisphere passing through supra-marginal convolution, showing the area of softening. F. S., fissure of Sylvius; L. N., lenticular nucleus; C. N., caudate nucleus; C. N., tail of caudate nucleus; Int. Cap., internal capsule; T. H., optic thalamus; P. O., parieto-occipital fissure; E. P. O., an external parieto-occipital fissure (?); Sup. Marg., supra-marginal gyrus.

The softening is more extensive. It reached nearly seven centimetres in the antero-posterior direction, extending anteriorly, and just involving the fibres behind the end of the lenticular nucleus and the tail of the caudate nucleus, where it passed into the descending cornu. Posteriorly, the white fibres of the occipital lobe were not involved. Internally, the softening reached to the ependyma of the posterior horn, which was dark in color. Externally, it touched, but did not involve the gray matter of the convolutions.

The internal capsule, the lenticular nucleus, the thalamus, and the crus seemed normal.

Section 5, at the level of the upper margin of the uncinate convolution.

Large area of softening, two inches in thickness and one in breadth, in the temporo-sphenoidal lobe, reaching to within two inches of its apex. Externally, it touched the gray matter of the third and the base of the second temporal gyri.

The corresponding sections of the other hemisphere were normal.

illness, occurring under such circumstances, was to be regarded as due to the enteric fever poison, and that he must be watched carefully, and all precautions taken, to avoid accidents or aggravations.

After a little longer tedious waiting, the illness cleared away, but his recovery was hindered by the occurrence of a carbuncle at the back of his neck. Before very long, however, this discharged its contents and began to heal up, and in point of fact it was almost healed when alarming, and, as it proved, fatal symptoms supervened. These were characterized by fever, with at first special development of urinary symptoms characterized by hæmaturia, evidently of renal origin, and scanty secretion of urine so marked that the possibility of retention was entertained and catheters passed without relief. I saw him in this condition on April 19th, and, although regarding the case as grave, I thought the renal congestion might pass off; I could not see him again; but further alarming symptoms supervened, and he died on the 22d, just as his daughter was beginning to recover. There was no post-mortem examination, but from the details of the symptoms given to me, there was no doubt in my mind that the case was due to some septicæmic condition or blood-poisoning, a recognized, though happily rare, complication of carbuncle.

III.

CONVULSIONS, PRESUMABLY URÆMIC, ABOUT THE SEVENTEENTH DAY.

The first death which occurred in the epidemic of fever amongst the nurses in the Western Infirmary, already referred to, was in a nurse twenty-three years old. She had a shivering on August 27th. She had pretty high fever, with slight diarrhœa, about September 4th. One or two doses of one-half grain of opium were given, and on the morning of September 9th her bladder was found much distended, and a large quantity of urine was drawn off, which, however, was thrown away without being tested. On September 10th she had some sickness and retching, and a loose motion was passed under her, without notice, at night; a little twitching at the wrists was noted. The urine was now found to be highly albuminous, and under the microscope there were very numerous granular and hyaline tube-casts. By September 12th the tremulousness and twitchings at the wrists had increased, and the muscles of the head and neck became involved; these tremors, for a short time, were accompanied by an alarming condition, with extremely bad and intermittent pulse. The bowels were somewhat looser than before, and so a lead and opium pill was given, with apparently some benefit. About 3 A. M., on the 13th, the nurse in attendance was alarmed by the patient making a convulsive clutch at her, and both arms and legs

had been, like many others, feeling poorly for nearly a week, with slight shiverings and squeamishness, but she was at work up till September 4th; next day she was put under my care, when her temperature was found to be 102.2° F. Her menses came on next day, her temperature fell to the normal and remained so. She was, however, kept under observation, but was allowed up on the 9th, as she seemed quite well; the temperature was taken regularly till September 14th, and was always normal. She still, however, was kept in the ward, although not regarded as a patient; but on the 20th and 21st she felt ill, with headache and sickness, and her temperature on the 21st, at night, was 103°. The case proved a bad one from the beginning, going on with persistently high fever till death on October 18th. We had here, as I take it, a fatal relapse, proving the first trivial illness to have been due to veritable enteric fever, although in the absence of any such relapse one could hardly have regarded, as more than an abortive febricula, a febrile attack which subsided completely the day after she took to bed.

In the fever patients under my care in this epidemic, there were many recrudescences and relapses; probably the way in which the fever was contracted accounted for different doses of the poisoned milk maturing at different times. In one of the other patients, a relapse occurred just at the same time that this girl began with her second and fatal illness. The peculiarity in this case was the extremely short and slight initial illness, contrasting with the obvious gravity of the second illness or relapse, if it may be called so, which declared its seriousness from the beginning.

II.

OBSCURE ILLNESS, WITH LITTLE OR NO PYREXIA, OBVIOUSLY FROM THE ENTERIC FEVER POISON; COMPLICATION OF CARBUNCLE, FOLLOWED BY BLOOD-POISONING AND DEATH.

A professional gentleman, over fifty years of age, residing at Helensburgh, had a series of illnesses in his family there. Some of those affected recovered after a short febrile illness of an obscure character; but one, a girl of about seventeen, had a somewhat alarming attack, undoubtedly due to enteric fever. It was to see her that I was sent for; after an anxious illness she made a good recovery. While there, however, my opinion was sought as to the state of my friend, her father. He had been, for a fortnight or more, "seedy," obviously quite unfit for work, but without any definite symptoms, without recognizable disease of any of the organs, and without pyrexia. His temperature had been carefully taken by his attendants and was never much, if at all, over 99° F. This was on March 13th. At my request, it was taken even more critically at nights, but without discovering any elevation of temperature. I could only agree with my medical friends, that such an

uneconnected with pressure, and this occurrence is adduced here as pretty positive proof in this case of what is often suspected in others, although (as in the case of the black heels) the influence of pressure can but seldom be clearly eliminated.

It should, perhaps, be stated that ergot of rye was used in this case pretty freely for the intestinal hæmorrhage; and, although it was not thought possible that the gangrenous spots could be due to this agent, it was deemed wise to stop it when the black spot appeared. This could be done the more willingly as any beneficial influence from its use on the bleeding in this or other cases was extremely dubious.

V.

ALARMING NERVOUS DISTURBANCE DEVELOPED WITH THE SUBSIDENCE OF THE PYREXIA.

A tablemaid in the Western Infirmary took ill on September 4, 1884, and the fever subsided on the 10th. A relapse began on the 21st or 22d, and during this relapse the temperature reached 104° F. on several days, but by October 2d it seemed as if defervescence had become established, as the temperatures only reached about 100° . All through these two attacks of pyrexia there were but few nervous symptoms, although on September 30th and October 1st, with a declining temperature, the patient was delirious, practically for the first time. On the 3d of October, and for several days thereafter, the catheter had to be used. Low muttering, with a tendency to get out of bed, now came on, and she had all sorts of terrible visions. There was also a very curious shaking and tremor of the head, with quivering in the face and eyelids; these movements of her head and eyes seemed to give rise in her mind to the idea that her attendants were staggering. When spoken to, she became quieter and answered quite nicely and sensibly, but soon relapsed into her muttering and quivering. No explanation was found in the state of the urine, which was secreted in moderate quantity and it contained no albumin. Along with this muttering and quivering there was complete sleeplessness. On October 2d a little brandy was tried, but it did not improve her. On October 3d a dose of Battley's Sedative Solution of Opium was given, and she slept an hour and a half, and on the afternoon of the 4th, after 20 minims, she again slept a little, and it was repeated at night; after this she slept four hours quietly, and was calm and settled in the morning. Some abdominal pain, complained of on October 5th, although alarming at the time, proved to be due to the menstrual period coming on. During the 4th and 5th of October she had been lying a little more prostrate than formerly, but even then she frequently lay on her sides, and even got up and tried to get out of bed at times; no such attempts occurred on the night of the 5th of October.

became rigid; the face also was found to be convulsed. She seemed quite unconseious during this convulsion, which lasted about ten minutes. The patient regained conseiousness and rallied from this attack, but the high fever and typhoid aspect did not abate; there were also deafness, abdominal distention, and diarrhœa. On September 15th she had fits of trembling, the breathing became rapid, and she died with a temperature of 108° F. on the night of the 16th.

The urine was drawn off twice a day from the time of the first retention; its quantity was about 35 ounces or more in the twenty-four hours, and the specific gravity about 1020 to 1025. The tube-casts continued to be present in enormous quantity, the hyaline casts containing faint granular matter. There was no post-mortem examination.

IV.

SMALL BLACK SPOT OF GANGRENE ON THE SOLE OF FOOT, APART FROM PRESSURE. RIGORS BEFORE DEATH.

A nurse, about thirty years of age, was sent to bed on September 8, 1884. The illness was a severe one from the beginning, with much nervous disturbance, high temperature, abdominal pains, and diarrhœa. Some intestinal hæmorrhage was noticed on October 2d, and repeatedly thereafter, sometimes in considerable quantity. Great feebleness and prostration came on, and she was put on a full-sized water-bed on October 6th, there being some redness of the back and a very small sore; this, however, did not increase, but rather improved, although the patient became worse. Next day, slight discoloration of the heels on their outer aspect was detected, but it was not very deep in color or extensive. The following day (October 8th) the fingers were dusky, and some dark discoloration of the dorsum of the feet was seen, and a small black spot appeared on the sole of the left foot, toward the outer aspect, but the skin remained quite whole in the feet till the end. The case was also complicated with cystitis. On October 13th a severe rigor occurred, and the breathing became very bad. During the next day another violent rigor occurred, and she died in the evening. These shiverings suggested pyæmic complications, but nothing more definite can be said about them.

In this case the discolored heels might perhaps have been ascribed to pressure in a debilitated subject, affecting a part of low vitality, although the area of blackness was on the outer aspect rather than the part pressed upon. The discoloration of the dorsum of the feet, however, pointed to the blackness depending on something different from pressure, although, perhaps, the weight of the bedclothes might be alleged, even here, as a source of pressure. The small spot of black gangrene, however, on the sole of the foot seemed to indicate the presence of a process quite

without difficulty, sequestra from both tibiæ. Some further portion of dead bone seemed to demand removal in May, but the patient and her friends insisted on her dismissal, and so the further course of the case cannot be traced.

A point worthy of note in this attack of periostitis was the occurrence of very acute symptoms at the beginning; not only severe pain, but also very high fever (103° or 104° F. on the 27th and 28th of October). In periostitis occurring as a sequela of enteric fever, surgeons have remarked on the absence of the fever and severe symptoms common in acute necrosis. Another point of interest in this case is the history of an old affection in the leg, presumably the result of scrofulous disease many years before the enteric fever, although the position of the symmetrical periostitis in the tibiæ was different from the old scar. (See an article by Dr. Hector C. Cameron, "Cases Illustrating Some Unusual Forms of Necrosis": *Glasgow Medical Journal*, August, 1881, vol. xvi. p. 107; in this article he quotes from Sir James Paget's essay "On Some of the Sequels of Typhoid Fever.")

VII.

GANGRENE OF THE LUNG.

A lady, about forty years of age, spending her holiday in Scotland, was seized with an acute illness in passing through Glasgow about the third week of September, 1889. This proved to be a severe attack of enteric fever, with high temperature and latterly intestinal hæmorrhage. From the first time I saw her in consultation, on September 30th, there were signs of congestion and partial consolidation of the right lung. There had been a little blood in the sputa, but a somewhat free hæmoptysis took place on October 6th, and on one or two subsequent occasions. As already stated, intestinal hæmorrhage occurred, and the danger from this seemed to be subsiding; but, toward the end of October, the breath and expectoration were noticed at times to be very offensive, and the unmistakable odor of gangrene was only too certain for a few days before her death on November 2d.

VIII.

PARALYSIS AND ANÆSTHESIA OF THE LIMBS AFTER RECOVERING FROM ENTERIC FEVER.

A mason, twenty-nine years of age, was sent to the Western Infirmary to be treated for paralysis. He had had enteric fever in the month of September, 1881; the attack was severe, and toward its close he seems to have experienced a benumbed sensation in his legs below the knees. On recovering, toward the end of November, he was able to go about

Between the morning of the 5th and the morning of the 6th a large bed sore formed near the sacrum, or rather at the edge of the right buttock; it measured $2\frac{1}{2}$ inches in diameter. The temperature was not over 100° F. The nervous system seemed quiet. The case went on without any special symptoms. Once or twice she passed water without notice after she had begun to tell when about to do so, and once the temperature rose to about 103° F., but this was probably due to the bed sore. A trace of albumin appeared occasionally in the urine. The slough in the sore began to separate on October 11th, leaving a deep ulcer, but it gradually contracted and was nearly healed by November 14th.

In this case we had the appearance of grave nervous symptoms during the decline of the pyrexia, reaching their most alarming phase when the patient might be regarded as almost over the attack; the gravity of these symptoms was emphasized by the remarkably rapid development of a large bed sore. No doubt the explanation was to be sought in the poisoning of the nervous system from the circulation in her blood of effete products resulting from the fever, even although no albuminuria existed at this time. I have seen somewhat similar conditions, once or twice, in pneumonia—the patient passing through the height of the fever in this disease with little or no delirium, and becoming violently delirious or maniacal after the supervention of the crisis.

VI.

DOUBLE PERIOSTITIS WITH NECROSIS.

A cleaner in the Western Infirmary, aged eighteen years, took ill with enteric fever on August 30, 1884. She had an alarming hæmorrhage, with three bloody motions, on September 5th, but she seemed to be getting over the fever on the 8th. On the 10th or 11th a relapse occurred, which underwent a favorable defervescence on October 1st or 2d. On October 20th some elevation of temperature occurred, and this was associated with pain in the right leg about two inches above the external malleolus, and this had been complained of for a day or two before. In this situation an old sore had existed seven years before, and it had discharged for a year. A few days later, swelling and tenderness appeared over the right tibia, evidently due to periostitis. About the same time some tenderness was noticed over the left tibia also. With this, great pain was complained of; the temperature ran up to 103° or 104° F. on the 27th and 28th. She was now removed to a surgical ward, under the care of Dr. Hector C. Cameron. The abscesses over both tibiæ were opened on November 12th, and bare bone felt in each; a third periosteal swelling, in the lower end of the femur, subsided without coming to an abscess. On March 3d Dr. Cameron removed,

gitis. I found him in a curious dazed state, with a vacant or distant expression, repeating in a clear voice various figures, say 1230, corrected quickly or hesitatingly into some other figure, and this going on for minutes together. I was so much surprised and interested that I sat at the edge of his bed watching his face and eyes. All of a sudden, his expression changed; he saw a stranger, and asked what I was doing there, and seemed offended. I said I was merely asking his name; he gave it correctly, hurriedly adding, "That is the name on my card." I asked where he was working, and he said, "Barclay, Curle & Co"; not catching the name of the firm, he repeated it, and when I did so after him, he mimicked my Scottish trilling of the letter "r," and commented on the pronunciation. Immediately thereafter he relapsed into his figures and calculations as before, with the same far-off look, and seemed to be unaware of anyone's presence. He was reported to me to have no pyrexia, but on taking his temperature that day we found it high. No signs of disease existed in the lungs. On examination, the bladder was found distended, and as it seemed important to ascertain whether the urine contained albumin, I waited till his doctor sent for his catheter and drew off the urine. It was perfectly clear, and contained no albumin. This was on September 13, 1884. I could only regard the illness as due to some inflammatory affection of the brain. When seen, however, next day and in a day or two later, it was found that his mind was much clearer, and, on the other hand, that his temperature was persistently high. We now encouraged his mother to believe that the alarming cerebral symptoms, owing to which she was sent for, might be due to the disturbance of enteric fever and not to meningitis. The case developed with abdominal symptoms in such a way as to lead to there being no doubt in my mind that the illness was due to this fever. There were, indeed, puzzling complications in the urinary organs, with pain on micturition, and blood and pus in the urine, beginning soon after the catheterization, and (as I had not used the catheter myself) I not unnaturally ascribed the disturbances to some accident from this cause. The state of the bladder and the painful micturition probably caused him to scream out at times, and to become somewhat rigid, but we hoped the bladder would improve with the subsidence of the fever, or at least that more efficient treatment of it would then become possible. By October 3d—that is, about the end of the third week—the temperature, previously declining, became normal and remained so. Although carefully nursed and fed, he had become very thin, and some discolored blotches appeared on the left side on September 26th. With the subsidence of the fever my fears as to the case were allayed, and frequent visits on my part seemed unnecessary; feeding up seemed the only thing required. On going back, however, after eight or nine days' absence, I was startled to find him wasted to the most extreme degree, perfectly

for some three weeks, although with a feeling of coldness and stiffness in the legs, and during this period he seems to have been exposed to wet weather. The weakness in his legs became worse, so that he had to lie up, and after this his hands became weak also, and rapidly became so useless that he could not feed himself. On admission, in January, the muscles of both upper and lower limbs were found to be wasted, especially the extensors in the forearm. There was also marked anæsthesia in the legs and feet, and to a less extent in the hands, arms, face, and trunk of the body. Excessive tenderness existed on handling the feet and the legs. There was a complete inability to stand; and, while lying on his back, he could not lift the legs off the bed, although he could flex the limbs at the knee to some extent. He could scarcely lift the hands up to the head, and the power of using the fingers for buttoning his shirt was quite lost; the grasp of the hands was also very feeble. No response occurred on tickling the soles of the feet: the cremasteric reflex was present; knee-jerks absent; no ankle-clonus. There seemed to be no paralysis of the bladder, although a little wetting of the bed occurred once or twice, apparently from his helpless condition. No response of the muscles of the arms and legs, even to strong faradic currents, could be obtained, while with the galvanic current it was only obtained with difficulty. Soon after admission a small sore appeared on his right scapula, from pressure evidently, but it soon healed with care.

The treatment consisted in the use of electricity, both currents being employed; and some tonic with strychnine was given.

He was admitted on January 10th, and by February 10th he could stand, if well supported; in a fortnight more he could walk with the support of a chair, and in another fortnight he could walk quite alone. The response of the muscles to the electricity improved concurrently and became normal, and the sensation likewise recovered.

His previous health had been good physically, but there was some history of mental aberration, at one time, and his intelligence was a little deficient at the best.

He was reported, two years later, to have kept well and to have gone to America.

IX.

CONCURRENT DEVELOPMENT OF ENTERIC FEVER AND TUBERCULAR MENINGITIS AND PYELITIS.

A young English gentleman, about twenty years of age, who was learning shipbuilding and engineering in one of the works on the Clyde, took ill, and after a day or two his illness became so alarming that I was asked to see him in consultation; he was supposed to have menin-

and pathological studies of Westphal⁽¹⁾, Spitzka⁽²⁾, Leube⁽³⁾, and Wernicke⁽⁴⁾, who have taught us to discriminate between the various subdivisions of the oculomotor nuclei, and have given us anatomical explanations of the many and complicated phenomena in polio-encephalitis superior (Wernicke), and in other conditions associated with ophthalmoplegia externa and interna.

Among other things, I wish to show that we should not be too ready to make the diagnosis of polio-encephalitis superior wherever and whenever partial ophthalmoplegia (external and internal) constitute the main symptoms of the affection. A diagnosis hastily made is often badly made.

CASE I.—My first case is one of unusually severe tubercular affection of the brain in a young child. The main points of the history, which I have been able to complete through the kindness of several colleagues, are these :

The child, E. S., aged three years, was first seen about the middle of November, 1889, by Dr. J. A. Meeks, in the Eye and Ear Department of the Northern Dispensary. At that time the little girl had double ptosis, but no other ocular paralysis was observed. The child was dull and listless. The pulse ranged between 165 and 160, but the temperature was normal. She was referred to the care of Dr. Scguin, at the Manhattan Eye and Ear Hospital, where Dr. Booth¹ took a very careful history. From his notes of December 9th I gather that the mother had noticed a change in the child's disposition since an attack of measles in the previous April. The child did not care to play with other children; preferred to sit quietly by herself all day long; staggered in walking, and occasionally fell. The child had no epileptic attacks, and had vomited but once. At this time (December, 1889) the child was stupid and deliberate in all her movements; walked with her feet widely apart; no staggering; very little strength in the hands. Right hand weaker than left. No anæsthesia or ataxia; knee-jerks absent. Paresis of both levatores palpebrarum, the pupils being half covered; no other paralysis of ocular muscles. No nystagmus. Pupils equal, moderately dilated, reacting to light and during accommodation. There was at this time a suspicion of optic neuritis. Pulse 140, and temperature of axilla 100.2°.

The child was brought to my department at the Polyclinic December 28, 1889. It was not known at the time that she had been seen by Drs. Meeks and Booth. A careful examination of her condition made before the students of the Polyclinic showed that there was double and almost complete ptosis. There was no upward or downward movement of either eye; both internal recti muscles were thrown into a clonic spastic condition when an attempt was made to use them. Both internal recti were capable of very slight movements, but all other external ocular muscles were completely paralyzed. Yet, strange to say, even at this late day the accommodation reflexes were distinct, and there was slight contractility to light in both pupils. A slight left facial paresis

¹ I am indebted to Dr. Booth for his kindness in putting the hospital records at my disposal.

free from fever, but with more of the obscuration of the intellect, coming, at times at least, quite suddenly. Nothing further could be found to explain his condition except the state of the urine, with pus and blood, and obviously great pain in passing it. The cerebral symptoms, however, seemed again too distinct to be ignored, and I had once more to revise my diagnosis, saying that the patient had evidently meningitis, as at first stated. He died on October 15th.

Before the post-mortem examination, I stated to Dr. Joseph Coats, who made it, that I believed we had had both meningitis and enteric fever in the case; but I could not think of any proper explanation of the extreme emaciation, or of the urinary symptoms.

The examination showed the intestinal ulceration characteristic of enteric fever, but the ulcers were far advanced toward cicatrization; they were quite clearly *not* of the tubercular form. There was perfectly distinct and typical tubercular meningitis, and extremely advanced forms of tubercular disease in the kidneys and the bladder.

The tubercular disease of bladder and kidney at once explained both the wasted appearance and the urinary symptoms. The perfectly-clear character of the urine at my first visit had kept me from thinking of this; the disease was no doubt present there long before that, but probably underwent rapid development after the catheterization.

The combination of symptoms of meningitis with those of the fever was most perplexing. The meningitis seemed to be so far arrested in its progress by the development of the fever, and reasserted itself with its subsidence.

DISEASE OF THE MID-BRAIN REGION,

WITH SPECIAL REFERENCE TO OPTHALMOPLÉGIA, AND A NOTE ON
POST-HEMIPLEGIC ATAXIA.¹

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It is my intention in this paper to analyze as briefly as possible a number of cases in which oculomotor symptoms have played an important rôle. I have been fortunate in obtaining two autopsies which furnished good proof of the value of those symptoms commonly supposed to indicate disease of the mid-brain region, and several other cases that were subjected to careful clinical examination, will help to enforce the points which I wish to make.

It is only within recent years that the mid-brain region has acquired great clinical and practical value. This is due largely to the anatomical

¹ Read at the meeting of the American Neurological Association, 1890.
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The sections were made from parts embedded in celloidin, and variously stained. It will be observed that there is no trace of the aqueduct of Sylvius in sections passed through the anterior quadrigeminal bodies, while in sections through the lower half of the pons one can observe the



Vertical section passing through the posterior quadrigeminal bodies.
T. Tumor. PQ. Posterior quadrigeminal bodies.

increased dilatation of the ventricle.¹ There is every reason to suppose, from a comparison of the symptoms and from the study of the anatomical specimen, that the tumor began to grow from the central gray substance. The tumor occupies almost the entire tegmental division of the crus, and has left only a very small portion of the corpora quadrigemina and the brachia intact.

Reviewing the history of this case, and comparing the clinical symptoms with the results of the post-mortem examination, we are struck by the fact that the one solitary tubercle in the vicinity of the corpora quadrigemina produced more mischief than the large number of lesions elsewhere in the brain. The occipital character of the headache, and the cerebellar staggering, are the only symptoms which can be ascribed to the tubercles in the cerebellum, though both these symptoms might be due to disease of the quadrigeminal region. Indeed, Nothnagel⁽²⁾ has recently claimed that cerebellar walk and nuclear affections of the oculomotor nerves are the most distinct symptoms pointing to disease of

¹ Further anatomical details are omitted.

was noticeable. Vision was very much impaired. Although in a condition of semi-stupor, the child walked before the class, and exhibited in so doing most distinct staggering, which reminded one of typical cerebellar gait. She walked with a broad base, and showed distinct tendency to fall to the right side. The oculist (Dr. Webster) reported a distinct plaque of choroidal atrophy below the macula of the left eye. The reflexes were exaggerated, and there were very evident occipital headaches. The right hand was weaker than the left, but otherwise the use of all four extremities was entirely normal.

The diagnosis of tumor of the corpora quadrigemina was made, and this tumor was supposed to be associated with a general tubercular meningitis. While the ocular symptoms pointed to the region of the corpora quadrigemina, the subacute character of the onset, the involvement of the sixth and seventh nerves, the weakness of one upper extremity, and the occipital headaches, indicated a general and widespread cerebral affection. The tubercular character of the disease was diagnosed from the general cachectic appearance of the child, from the peculiar development of the symptoms in the last weeks, and from the information given us, that an uncle of the child had just died of phthisis.

The child grew rapidly worse, and could not be brought to the clinic. At my request Dr. Peterson kindly visited the child at its home and kept track of it to the end. The child had occasional convulsive seizures, grew blind, became comatose, and two weeks before death developed left hemiplegia. There was no change in the eye symptoms, unless the light and accommodation reflexes disappeared, but this point could not be positively determined, owing to the comatose condition of the child. The child died February 4, 1890, four months after the onset of the symptoms.

By strategy and Dr. Peterson's persistence an autopsy was obtained, and the brain was removed by him. The dura was adherent to the skull, and had to be removed with the calvarium. The quantity of subdural fluid was slightly increased. There was discovered at once a tumor (solitary tubercle) near the right lateral sinus, about one centimetre in diameter and pressing upon the lateral edge of the cerebellum, producing thrombosis of the lateral sinus. Other tubercles surrounded by large areas of softened tissue were found in the cerebellum. An examination of the brain at my leisure showed that the hemispheres were healthy, with the exception of small tubercular deposits along the bloodvessels. The cerebellum was the seat of most profound changes, containing several large solitary tubercles. At the base there were several uncommon conditions; there was an unusual thickening of the pia, with small tubercular deposits between the corpora mammillaria and the optic chiasm, and in the interpeduncular space, the thickening here being so great, though probably of recent date, that both third nerves, instead of lying across the crura, after removal of the brain, pointed backward, and the right sixth was twisted out of its normal position. The brain was not cut into until it had hardened for about a week in a two-per-cent. solution of bichromate of potash. Cutting through the level of the corpora quadrigemina a tumor was found, as anticipated, the size of which will be best appreciated by an examination of Fig. 1. The brain was allowed to harden for many weeks in bichromate solutions of increasing strength, and later on in alcohol.

latter instance, yet the following case will serve to illustrate this difficulty :

CASE II.—In August, 1889, I was asked by the late Dr. Cocks to see Mrs. L., aged forty years. She had been married for many years, but had never been pregnant; was always in excellent health until five years ago, when she began to be troubled with headaches and vomiting, cerebral in character, and a peculiar sensation in the head on looking upward. At the same time she noticed that she saw things double, particularly on the street and on looking through an opera-glass. These symptoms had continued, with slight intermissions, up to the day of examination, except that the paresis of the eyes had very much increased. She was in the habit of keeping the left eye closed altogether, in order to have single vision. Had vomiting-spells occasionally, and some few fainting-spells many years ago, which may have been due to profound anæmia. My examination was entirely negative, except as regards the eyes. There was marked paresis of both internal recti in united and single action; external recti act fairly well, but nystagmus movements result if the attempt is made to bring the eye to the outer canthus. Upward movement of the eyes barely possible; downward movement also limited. Pupils react normally to light and during accommodation. Ptosis is said to have existed, but is not present now. Knee-jerks normal, and sensation absolutely so. At this time I made the diagnosis ophthalmoplegia nuclearis externa, probably due to a polio-encephalitis chronica, but remembering the occasional vomiting, I mentioned the possibility of tumor; not really believing it, however, but yet feeling disposed to give the patient the benefit of the doubt, I urged the continuance of active mixed treatment.

The further course of events was rather surprising. About two months after I had seen the patient for the first time, I had the privilege of examining her again. She was troubled severely with headaches and vertigo, and had been alternately drowsy and wakeful. In addition to these symptoms, she developed incoördination and characteristic cerebellar staggering. On October 5th, Dr Cocks reported to me that he suspected optic neuritis; and on October 17th there was very marked double optic neuritis, and the patient was no longer able to stand without support. The symptoms of tumor were so distinct that the idea of a polio-encephalitis superior had to be abandoned. The patient died October 31st, having become almost blind and wholly unable to leave her bed for some days before death. In spite of the most strenuous efforts, the husband refused an autopsy.

The idea of tumor in this case can scarcely be rejected, yet no one, I think, would have supposed that for more than five years the growth of the tumor in this region would be so gradual as to affect certain cell-nests only, and not the entire nuclei; for it will be remembered that the sphincter and ciliary muscles were entirely free as long as a detailed examination could be made. If asked to carry the diagnosis still further, it would be fair to say that there may have been a gummatous infiltration of this region, as has been found in other cases, notably in one of Thomsen's (?); that this increased very slowly, diminishing at times and again growing anew, thus bringing about a chronic and variable

the corpora quadrigemina. In this he has been supported by the few authors who have reported cases since the publication of Nothnagel's article, notably by Alfred Christ (6) in an able paper on this subject.

If we consider the intimate anatomical relation between the corpora quadrigemina and the cerebellum through the anterior peduncles of the cerebellum, there is nothing surprising in the fact that cerebellar staggering should be a symptom common to disease in both of these regions. In this case it will be impossible to determine whether this one symptom was due to disease of the corpora quadrigemina or to the involvement of the cerebellum; but, inasmuch as the ocular symptoms preceded all other symptoms for some considerable length of time, it is safe to say that cerebellar staggering is not one of the *early* symptoms of disease of the quadrigeminal bodies, though it is undoubtedly a symptom that is developed in the later stages of such disease. An examination of sections through the pons showed that the sixth and seventh nerve nuclei were entirely normal; they can, therefore, not be held responsible for symptoms pointing to involvement of these nerves, but this must unquestionably be placed to the account of the basilar meningitis.

Certain it is, that this meningitis was not the cause of the oculomotor symptoms; for months, or at least for weeks, the symptoms were distinctly nuclear; both levators were affected long in advance of other muscles, and the internal recti muscles retained some function long after the other muscles supplied by the oculomotor nerves had been completely paralyzed. In spite of the manifold morbid conditions, it is most remarkable of all that the ciliary muscles and the sphincter iridis should have remained exempt during the entire period of observation—a striking proof of the fact that the nuclei of these two muscles are at some distance from those governing the other and external muscles. Moreover, the fact that the levatores palpebrarum were affected to the exclusion of other muscles for a long time would point to the main cell-nests of the third nerve nuclei as the original seat of the tumor.

Whether the tumor invaded both sides at once, or whether the decussating fibres from the main cell-nests are responsible for the bilateral character of the nuclear symptoms cannot be determined by cases of tumor.

The chief inference to be drawn from this case is that symptoms of ophthalmoplegia externa and interna, if associated with symptoms pointing to a new-growth within the brain, will serve to locate that growth in the vicinity of the corpora quadrigemina.

Considering the compactness of all cerebral structures in the mid-brain region, one would expect that there could not for an instant be any difficulty in making a differential diagnosis between cases of tumor of this region and a chronic inflammatory process. One would expect a far greater number of pressure-symptoms in the former than in the

externus of the right eye showing slight paresis at times, and then again disappearing.

After months of treatment, and several months during which treatment was entirely suspended, the condition has changed in some respects. The left eye is now altogether better than the right eye. The left ptosis has been considerably relieved. The left rectus externus brings the eye to within one-eighth of an inch of the canthus, and all the other ocular muscles have normal function, but now the right eye is worse. The right rectus externus can bring the eye to within one-fourth inch only of the canthus. Upward and downward movements are normal, but the right pupil responds very sluggishly to light, while it does fairly well during accommodation. Right ptosis is more marked than left.¹

In this case it is worth noting that an actual improvement of the condition of the left eye set in some time after all anti-syphilitic treatment had been abandoned, and that, while the left eye continued to improve, symptoms set in in the right eye very like those of the other eye, which had been the starting-point of the whole trouble. The entire history of the case is in favor of the specific origin of this trouble, yet if we remember that there was ptosis of one eye, paresis of the rectus internus of the same eye, and involvement of the rectus externus, while the other muscles supplied by the oculomotor nerve remained intact, we see that we have a group of symptoms closely resembling those of nuclear disease. Yet I cannot conceive, in view of the marked improvement of the left eye, that such is the case, and we are therefore forced to the conclusion that a specific infiltration of the oculomotor nerves may simulate disease of the oculomotor nuclei. This would be a point of some importance in the differential diagnosis of those cases in which apparently nuclear symptoms occurred in individuals who give no history of previous specific disease.

Fournier⁽⁹⁾, Rumpf⁽¹⁰⁾, and Oppenheim⁽⁶⁾ are all agreed as to the occurrence of partial ophthalmoplegia in cases of syphilitic disease at the base of the brain, and Thomsen's case shows that a nuclear paralysis can be simulated by a gummatous infiltration of the root-fibres.

I cannot help thinking that just as the larger peripheral nerves are mixed nerves, giving rise, under certain conditions of disease, to motor or sensory symptoms, and not necessarily to both, so the oculomotor nerve is a mixed nerve, and that certain diseases affecting the third nerve show a predilection for definite sets of fibres. The anatomy of the third nerve rootlets has not been so clearly studied that we can point out the fibres or sets of fibres going to each muscle of the eye; but there is already good reason to suppose that the innermost rootlets are those which represent the internal rectus. A comparison of this case with others leads me to believe that, while we should keep the possibility of

¹ In Feb. 1891, the patient presented himself again. The ptosis of both eyes has disappeared entirely: the right eye is entirely well, and in the left eye there is nothing but a slight paresis of the rectus externus.

group of symptoms. This inconstancy¹ of symptoms in specific disease of the cerebral nervous system has been correctly insisted upon by Dr. Oppenheim⁽⁸⁾, of Berlin, in a very able discussion of the subject. In the case I have just discussed there is still another possibility—there may have been a mere gummatous infiltration of the oculomotor nerves which caused symptoms resembling those of nuclear disease, and toward the latter part of the disease the growth of a large gumma may have given rise to those symptoms which pointed so clearly to the development of a neoplasm.

But whether we had here to deal with gumma or mere gummatous infiltration, it is important to note that the manner in which the case terminated disproved the diagnosis of polio-encephalitis which for months, if not years, was the only safe diagnosis to make.

In this connection I am reminded of the difficulty of diagnosis in still another respect: since our anatomical knowledge has been worked out to the finest details, it is a point of some practical value to diagnosticate the character of the morbid process. Syphilis—ocular paralyses, gummatous infiltration of the base—is the natural sequence of our thoughts in many cases, and yet the symptoms which we observe frequently make it difficult to determine whether the disease is of nuclear origin, or whether the oculomotor root-fibres are affected by specific disease of the base of the brain. The following case will illustrate this point:

CASE III.—During many months, Dr. Gruening, who was kind enough to refer the patient to me, and myself, have had repeated occasions to examine a young gentleman from the western part of New York State. The patient is now thirty-three years of age, single; his family doctor reports that he had chancre with secondary eruption fourteen years ago, was thoroughly treated, no trace of syphilis since that time. Has never had headaches, and extremely well otherwise. Has been a hard worker for years. A year ago returned from an extended tour abroad. During this tour had spent weeks on the Lybian desert, and is inclined to think that the glaring white sand (he never wore glasses) is the cause of his trouble. Shortly after his return he noticed that he began to see double and that his eyes drooped. My examination of the ocular condition brought out the following facts: Left ptosis covering three-fourths of pupil; eyelid can be raised a little by great effort. Reflexes to light and accommodation almost normal. Left pupil possibly a little sluggish to light. Left abducens completely paralyzed. All other movements of eyes are perfect, inward, upward, and downward. Dr. Gruening found swelling and redness of the left optic disk. The patient was placed upon a most vigorous course of the iodides, taking as much as one hundred and fifty drops of a saturated solution of the iodide of sodium three times a day for weeks. This he bore extremely well, his general health remaining excellent. His condition since has varied somewhat, the rectus

¹ And yet this statement should be accepted with some reserve, for in the case of gliosarcoma reported by Christ (*loc. cit.*) the symptoms were variable enough.

me to make satisfactory sensory tests. The diagnosis of crus lesion of right side, probably softening from thrombosis, was corroborated by the autopsy.

The autopsy was made a few hours after death. The dura was found adherent to the skull; the pia could be readily removed from the entire surface of both hemispheres. Nothing abnormal about the appearance of the convexity. An inspection of the base of the brain revealed at once the small size and extreme softness of the right crus as compared with the left. The right oculomotor nerve was as thin as a thread, the left about of normal size. The vessels of the brain were carefully examined, and no changes were found except in the post-cerebral artery of the right side, which was plugged by a firm thrombus that had evidently been formed *in situ*. Beyond the thrombus the artery had been reduced to a mere thread. The brain was handled after Meynert's fashion, the ganglia being dissected away from the hemispheres. The cortex was found entirely normal, and in all the organs above the crus there was nothing of any significance. The brain was hardened in the usual way in Müller's fluid and alcohol. Every part except that which was the seat of the lesion hardened well. After the brain had become slightly hard, the crura were cut across, showing distinctly the absolute disintegration and atrophy of the right crus, the process having exceeded the middle line by a fraction of an inch. Sections were laid throughout the pons, medulla, and spinal cord; and, almost at every level, distinct degenerated fibres were found in the pyramidal tract and in both lateral tracts, yet the degeneration was not as pronounced as one might have expected from disease of such long standing. Sections of the right oculomotor nerve exhibited complete degeneration of the fibres, while the left third nerve also showed some degeneration on cross-section, though there were but very few fibres thus affected.

The occurrence of ataxic movements in cases of crus lesion is the one point to which I wish to call attention, while the ocular condition will serve to show how radically different the symptoms are in cases in which the entire nerve is affected by disease. The cortex and the sub-cortical ganglia were entirely normal, yet this peculiar disturbance of motion was like those we are accustomed to see in the wake of infantile cerebral palsies, a full description of which has been given in a previous paper by Dr. Peterson and myself⁽¹⁾. In children the lesion is very often cortical, occasionally it is in the vicinity of the ganglia, but in the case with which we are at present concerned the same order of symptoms is produced by a lesion much further caudad. I accept this case as proof of the correctness of the views previously expressed, that these peculiar movements may be due to the removal of inhibition, but that there must be some irradiation of nerve force from one half of the central nervous system to the other, and that this irradiation takes place at any diseased level as low down as the pons and medulla, and possibly even in the spinal cord. Associated movements are explained readily enough on this hypothesis, but why these extreme and violent ataxic movements should occur by transmission of motor impulses through such an imperfect motor tract as we had before us is not so easy to see.

nuclear lesion in mind in such cases as the one just described, a preceding history of specific infection, and the inconstant character of the symptoms, indicate specific disease of the third nerve roots, rather than of the third nerve nuclei.¹

To the preceding cases we may add, properly enough, another in which the oculomotor symptoms were distinct, yet not so striking a feature as the peculiar disturbances of motion which lent a special interest to the case. The situation of the lesion in this instance is of special importance, by way of throwing some light upon the origin of post-hemiplegic disturbances of motion.

CASE IV.—The patient was a married woman, fifty-seven years of age at the time of death, December 2, 1889. Very nearly seven years previously patient felt dizzy one morning and found her vision rather blurred. This condition passed away, but returned again after fifteen minutes. She remained seated in her chair, was not unconscious for an instant, and had no trouble whatever in speaking. She attempted to walk, found this rather difficult, but did not fall. The difficulty increased, and by the following morning she had almost complete left hemiplegia. She could not open either eye. The attending physician noticed, on raising the eyelid, that vision was dim. What the position of the eyes was at this time could not be ascertained. Speech was also heavy and indistinct, but from this the patient recovered within three weeks. There was no defect of any other special sense. The hemiplegia was never recovered from. Patient became somewhat unruly and demented, and was finally taken to the Montefiore Home, where she was an inmate for many years. As far as could be determined, patient had never had syphilis, but there was very marked atheroma of all peripheral arteries: the patient was prematurely old. In addition to her left hemiplegia, she also had lost the use of her right leg, which had been amputated above the ankle on account of necrosis of the tibia fully six years ago. Being bedridden, she was covered with a succession of sores, and was altogether a revolting sight. The right eye at the time of my first examination was completely closed, the globe was rotated so that the pupil stood in the extreme outer corner of the orbital cavity; there was not the least possibility of movement inward, upward or downward. The pupil was widely dilated; no reflex to light; accommodation reflex, of course, could not be tested. There was rigidity of the left leg, and increased knee-jerks on both sides. The wrist-reflex was decidedly increased on the paralyzed side, but this left upper extremity was subject to the wildest ataxic movements. I call them ataxic, for they remind me of the extreme ataxic movements of the legs in the last stages of *tabes dorsalis*. If our patient was asked to use the paralyzed hand, say, in order to squeeze the physician's hand, this paretic extremity was whirled about so violently as to be a source of some danger to those near the bed. After a little, the arm would fall down from exhaustion, and remain quiet until aroused again. The patient's condition grew worse during the latter half of the year; she became extremely emotional and demented, took very little nourishment, and finally died December 2d. She was not intelligent enough during the time I observed her to enable

¹ This conclusion is supported by other cases to which I shall refer in a later article.

and M. Nogués, make a vigorous attack upon what they are pleased to call the "American" method of treating gunshot wounds of the abdomen. In a long argument, supported by eighty-eight tabulated cases treated conservatively, the old "Laissez-Faire" doctrine is again preached with an enthusiasm which will be sought for in vain in the writings of its earlier advocates; for while these (the earlier advocates) clung to the principle of non-interference, most of them did it as the drowning man clings to the straw—not because he believes it has power to save, but because it is the only thing he can lay hold of. But here we have the principle set forth in an entirely new aspect, and if the bold claims which are advanced in support of it are true, then, indeed, are the laurels which American surgeons have won in this department of their art destined to be short-lived.

The penetrating shot-wound of the abdomen, so dreaded by the surgeons of the past—and justly, too, it would seem, when the highest authorities place the mortality between 80 and 90 per cent.—is now, for the first time, shown to be a comparatively insignificant injury, with a mortality of only 25 per cent.

We naturally expect these brilliant and extraordinary results to be accredited to some newly-discovered method of treatment, but finding the old method of non-interference carried out in every case, we are forced to look for some way of explaining the lack of harmony in the results.

In the *Med. and Surg. Hist. of the War of the Rebellion*, Part II., vol. ii. p. 202 (Otis), we find 3249 cases of penetrating shot-wounds of the abdomen treated expectantly; of these, 88 per cent. died. In the Franco-Prussian War, 1870, 1600 cases of penetrating wounds of the abdomen were reported, with a mortality of 69.47 per cent. (*Centralblatt für Chirurgie*, Dec. 1889).

Still later are the statistics of the Tonkin War—72 cases, with a mortality of 75 per cent. (*Archiv de Méd. et Pharmacie*, 1889).

If to the foregoing we add the New York statistics reported by Dr. Lewis A. Stimson (*N. Y. Med. Journ.*, Oct. 22 and Nov. 2, 1889), we have a total of 4958 cases of penetrating wounds of the abdomen treated according to the method of abstention and showing a mortality of 81 per cent.

In spite of these figures, believed by many of the best authorities in abdominal surgery to be too low rather than too high an estimate of the mortality of penetrating wounds of the abdomen—at all events, high enough, it would seem, to convince anyone of the inadequacy of the method of non-interference—its new defenders and champions have given us a table containing 88 cases of shot-wounds of the abdomen, with signs sufficiently pathognomonic in their opinion to warrant their being considered as penetrating, with a mortality of only 25 per cent.

It would seem as though the motor impulses in this case had been transmitted from the healthy side—a sort of overflow of volitional energy from the sound side which is not restrained by the ordinary inhibitory force; the removal of this inhibitory force being due to the lesion in question. From all of which we make the very natural deduction that the two halves of the central nervous system in health coöperate by antagonizing each other's forces, each half in health placing a check upon the superabundant energy of the other.

The preceding communication will serve to illustrate the following points:

1. The slow onset of oculomotor symptoms associated with ataxia and vomiting point to a neoplasm in the vicinity of the corpora quadrigemina.

2. The diagnosis of polio-encephalitis superior (Wernicke) should not be made unless tumor of the quadrigeminal region can be positively excluded.

3. Paralysis of one or more muscles, and not of all muscles supplied by the oculomotor nerve, do not necessarily imply a nuclear lesion. This is particularly true of syphilitic cases, in which an affection of the nerve rootlets may give rise to symptoms exactly like those of nuclear disease.

4. Post-hemiplegic ataxic movements may result from lesion of the crus, and probably from lesion in any part of the motor tract.

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THE TREATMENT OF PENETRATING GUNSHOT WOUNDS OF THE ABDOMEN,

WITH AN ANALYSIS OF ONE HUNDRED AND SIXTY-FIVE CASES
TREATED BY LAPAROTOMY.

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IN the *Revue de Chirurgie* of February, 1890, in an elaborate article fifty-three pages in length, two well-known French surgeons, M. Reclus

Again, it has been objected that the opinion as to the high mortality of this class of injuries is based upon military statistics, and that in consequence of the larger size of the bullets in these cases the mortality would necessarily be much higher than in cases occurring in civil life. A glance at my tables will show that the severity of the lesion and the mortality bear no direct ratio to the calibre of the weapon, and that even the smallest bullet has caused extensive visceral injuries. Dr. Stimson, in his very admirable monograph already referred to, says in regard to this point: "The size of the opening, while corresponding in a measure to that of the bullet, is yet so seriously affected by other circumstances that no favorable prognostic influences can be safely drawn from the small size of the ball. Thus, in Kocher's case, a 0.22 calibre bullet made an opening in the stomach $1\frac{1}{2}$ centimetres in diameter, and a small ball entering obliquely¹ or cutting along the convexity of a loop of intestine has made an opening an inch or more in length."

In their efforts to detract from the success of the operative method of treatment, M. Reclus and M. Nogués object to the tables of the "interventionists," and accuse them of placing to their credit cases of simple enterorrhaphy practised upon a single coil of wounded intestine protruding from the wound—a simple operation, not dangerous, and in no respect resembling a complete laparotomy, with careful examination of the entire intestinal tract; and they further say that these cases cannot be counted among those "saved by laparotomy," nor likewise can those in which there was no visceral injury and the intestines were not perforated, and with this assumption they at once proceed to exclude in a wholesale manner the cases of Sevastopoulo, Skelly, Smartt, Murphy, Barker, Brown, Cabot, Jalaguier, all of which recovered under operation, thus reducing the number of cases in Class I. (operation performed within first twelve hours of the injury) from 55 to 47, and increasing the mortality from 63 per cent. to 76 per cent. The cases in Class II. (operation after twelve hours) are dealt with in the same way, and the cases of Bull, Andrew, Frick, Newald, Gaston and Hillmantel (4 recoveries and 2 deaths) are ruled out, raising the mortality to 90 per cent.

Before dealing with the question as to the propriety of excluding the above-mentioned cases, there are a number of cases in M. Reclus's tables (103 cases treated by laparotomy, *Revue de Chirurgie*, May, 1890), the removal of which admits of no question. First, the two cases accredited to Hillmantel (both fatal) are duplicates, appearing a second time under the name of Fenger, who performed the operations, Hillmantel simply assisting and reporting the cases, as may be seen by referring to the original reference (*Journ. Amer. Med. Assoc.*, July 21, 1888).

¹ The recent experiments of Schachner bear out the same conclusion.

This brilliant record they point to as proof of the superior results of abstinence.

In my former paper (published Oct. 18, 1888, *Boston Med. and Surg. Journ.*) in reference to this very point, viz., the large number of cases of recovery without operation, cited by M. Reclus in a previous article, I said: "More light must be thrown upon some very important omissions of M. Reclus before he can have good ground for expecting American surgeons to accept his views. Suppose we accept his 50 cases of recovery without operative interference as authentic, what do these prove? Absolutely nothing, until we are told how large a number of cases that did not recover were found before getting the 50 cases that did recover."

In his recent tables containing 88 cases with only 22 deaths, the author evidently considers this point satisfactorily disposed of, and would have us believe that out of 88 cases of penetrating shot-wounds of the abdomen, 75.7 per cent. recovered under conservative treatment.

Without in any way casting the slightest suspicion upon the trustworthiness of the statistics or the conscientiousness exercised in the selection of the cases, I think it can still be claimed that the tables prove *absolutely nothing* as regards the comparative merit of the two methods of treatment. The cases referred to are either cases which have been collected from published reports in the various medical periodicals or cases which have come under the immediate observation of the writers themselves. Now, as a matter of fact, a very small proportion of the fatal cases would naturally find their way into medical journals, while there would be every reason for bringing to notice a case of recovery from an injury that had come to be regarded, in the light of the best surgical opinion, as almost universally fatal.

In this way the large number of recoveries in the table can be easily explained; far more easily than by supposing that the unanimous opinion of the most renowned surgeons for generations as to the high mortality of this class of injuries has been totally without foundation.

It might, however, be said on the other side that the same objection would apply to the statistics of cases treated by laparotomy, but a moment's thought will convince one that this is not so.

While there are a few scattered cases before 1883 and 1884, not until then did the brilliant successes of Kocher, Bull and Hamilton bring the operation prominently before the surgical world. It soon became a leading subject of debate in nearly every surgical society of this country, and a glance at the reports of European societies will show that the interest in it was not confined to America alone. Every new case in which the operation had been performed was eagerly sought for, and whether successful or otherwise its result, with rare exceptions, was soon made public.

exists, and rarely then unless fæcal extravasation has taken place. In other words, that the chief and almost only cause of death (aside from hæmorrhage) is peritonitis. That this is a false assumption was very ably and conclusively proven by Dr. J. Marion Sims in his well-known paper ⁽¹¹⁾ published in the *Brit. Med. Journal*, 1882. He says: "When I went to Sédan, in 1870, as surgeon-in-chief to the Anglo-American Ambulance Corps, I went in the hope that I might do something to elucidate the subject of the treatment of gunshot wounds of the abdomen. I learned this great truth—that all the cases died of septiciæmia. The post-mortem examination showed large quantities of bloody serum in the abdominal cavity. In every case there was this evidence of blood-poisoning, and there was not the slightest evidence of peritonitis. There was not a single exception to this rule. Bloody serum is an ordinary result of any gunshot wound of the fleshy parts of the body, and it is not unnatural that it should be found in wounds of the peritoneum. It is possible that an escape of flatus or of contents of the intestine may give intensity to the poisonous quality of the bloody serum in the abdomen."

That perforation of the intestine is by no means necessary to render the wound fatal, is not only shown by the case of Gaston which I have already cited, but is proved in a very striking manner by the four cases of Dr. Hunter McGuire ⁽¹²⁾ reported at the meeting of the American Medical Association, 1881. These cases were all shot-wounds of the abdomen (2 military, 2 civil), but the ball passed transversely through the abdominal wall without penetrating the parietal peritoneum, simply bruising it. All the cases died, and a considerable amount of bloody serum was found in the abdominal cavity in every case; in reference to these cases Dr. Sims says: "Death resulted practically as it would have done had the peritoneal cavity been penetrated and the intestine perforated."

Enough has been said, I trust, to show that wounds of the abdomen to be fatal do not require perforation of the intestine, and enough to justify the right to place the 12 recoveries above referred to to the credit of operative interference. Taking for granted the proposition which I shall attempt to establish later on, that operative interference in penetrating shot-wounds of the abdomen produces results superior to those obtained by abstention, one very important point still remains to be decided, viz., Shall the principle of interference be subject to more or less narrow restrictions, or shall it be regarded as a principle of universal application? Upon this point the advocates of laparotomy are divided.

Dr. Stimson, in the paper already referred to, says: "Between the two parties—those who would operate in every case, and those who would operate in none—stands a third, those who would operate only when symptoms indicative of dangerous processes have appeared; but I believe this plan the most dangerous of all, and if it were generally

Again, the cases of Larry, 1799, Judson, Bently and Gill (*War of the Rebellion*, see Otis's *Hist.*) were all cases of "simple enterorrhaphy," the wounded gut protruding, and in none of them was a true laparotomy performed. It is singular that these cases, the very ones which Reclus claims should be excluded from the tables of the "interventionists," should find a place only in his own tables.

As late as 1877, "Bauden's enlargement of the parietal wound remained unique," Stimson (*loc. cit.*). Thus 6 cases, 5 deaths and 1 recovery, should undoubtedly be excluded, thus reducing the total mortality of M. Reclus's tables to 64 per cent.

Now a word in regard to the 12 recoveries which M. Reclus says should not be counted among those saved by laparotomy.

The cases of Cabot and Jalaguier were both perforating wounds of the stomach.

The cases of Vaslin and Sevastopoulo, multiple wounds of the small intestine, and in both resection of a portion (2 to 4 centimetres) of the small intestine was performed.

The cases of Smartt, Murphy, and Barker had extensive wounds of liver and blood in abdominal cavity.

In the case of Bull, operation was done twelve and a half hours after injury. There was profound shock, surface of body cold, temperature 94° , and evidence of internal hæmorrhage. Operation was done to control hæmorrhage, if possible, but patient died one-half hour after ether was started. Would abstention have given any better chance of recovery?

The cases of Brown, Andrews, and Skelly showed a considerable quantity of blood in the abdominal cavity. The abdomen was washed out and the patients recovered.

The cases of Gaston and Frick are the very cases in which Reclus himself advises laparotomy, viz., where well-marked signs of peritonitis have developed. The case of Gaston was operated upon at the end of the fourth day (surgeon not called before). The intestines were found greatly distended and there was a large quantity of decomposed blood and pus in the abdominal cavity. The patient died two hours after the operation; the autopsy showed *no wound* of the intestinal tract, and only an abrasion of the colon.

In the case of Frick the patient was not found until twenty-five hours after injury; was brought to camp hospital two days later, and signs of peritonitis having developed, operation was performed on the sixth day. A large lacerated wound of the liver was found and a deep abscess had formed along the track of the bullet. A six-inch abdominal incision and free drainage; patient made a good recovery.

M. Reclus, in all his writings on this subject, argues upon the assumption that a penetrating wound of the abdomen is serious and likely to be followed by fatal consequences only when perforation of the intestines

came into the hands of the surgeon, and are "hopeless without operation," are *not more* hopeless with it.

Sims, in reference to late operation, when signs of peritonitis have already developed, says: "Nature cures peritonitis in the early stages by uniting contiguous inflamed surfaces by the intervention of plastic lymph; but if the inflammatory process has gone further, and the plastic exudation has terminated in pouches of pus in the folds of the intestines, or purulent effusion in the peritoneal cavity, then death follows from the absorption of the fusiform collection. In this stage why should we not open the abdomen before it is too late, liberate the adhesions, and remove the matter which is imprisoned in pouches or free in the cavity?"

This can be done, and will be done, for it is but the imitation of Nature's clumsy efforts in this direction. It is true that these conclusions of Sims are entirely theoretical, arrived at by inductions based upon his experience in the operative treatment of ovarian disease. To show that they were well founded I need only to call attention to the constantly-increasing number of recoveries from general septic peritonitis, treated by laparotomy and drainage. The case of Sands, following perforation of the appendix (*Medical Record*, February, 1888), was considered almost unique, but the number of cases since recorded shows a brilliant outlook for the operation in the future.

Within the past six months there have been two cases of recovery from acute septic peritonitis treated by laparotomy at the New York Hospital, by Dr. W. T. Bull, the one from the perforation of a gangrenous cæcum; and the other consequent upon the rupture of a suppurating Fallopian tube. Dr. Stimson himself has very recently had a similar case in private practice following a perforating appendicitis, in which he operated more than twelve hours after the acute symptoms had developed, and found a considerable amount of seropurulent fluid in the abdominal cavity. The patient made a rapid recovery. The experience of Tait still further confirms us in the opinion that operative interference should be resorted to in the desperate cases we are considering. Writing in 1885, he says (²¹) that since Wiltshire first did a laparotomy for acute peritonitis in 1868, and the patient recovered, he himself has opened the abdomen forty-four times for peritonitis, and forty-one of the patients recovered; that he began by operating for peritonitis following ovarian disease, but soon became convinced that there was no reason whatever for thus limiting the operation, and since then he has never allowed a patient to die from peritonitis without opening the abdomen, provided the consent of his colleagues and of the friends of the patient could be obtained. That this principle is rapidly gaining ground, not only in England and America, but also on the Continent, is shown by the recent paper of Kreke (²¹), "On the Surgical

followed would lead to the entire abandonment of the operation. We know that an individual in fairly good health can have his abdomen explored without very great risk, and one who has received an abdominal wound not necessarily fatal ought at the moment, or shortly after, to be able to bear an exploration equally well. In such cases the risk of operation, when performed under the proper safeguards, is, I believe, less than that which the bullet has probably inflicted, and it is in such cases that I believe the operation is capable of valuable and superior results."

Dr. Stimson then goes on to say that if several hours, or perhaps a day, has elapsed and the patient is doing well, it might be better to abstain from interference; while if the condition has decidedly changed for the worse and signs of peritonitis have developed, the indications for refraining from operation are even stronger, and though the case may be considered hopeless without it, it is all the more hopeless with it.

To take these two classes of cases in order: first, a word in regard to those cases in which, after the lapse of several hours, the patient is apparently "doing well." Dr. Bull's first case is in point—seventeen hours had passed. There was some pain and tenderness, but pulse and temperature were normal, and patient was "doing well." Laparotomy was performed; seven wounds of the small intestine were found and two pints of bloody serum and clots were found in the abdominal cavity. The wounds were closed, the abdomen washed out, and the patient recovered. Can anyone believe that the case could possibly have recovered without operation? The case of Lange is likewise in point. Twenty-four hours after the injury the condition of the patient was as follows: No shock. Pulse 112. No pain. Abdomen tender and some tympanites. Laparotomy disclosed seven perforating wounds of the small intestine. Wounds were closed, and patient recovered without a bad symptom.

In regard to the second class of cases, when the condition of the patient has become much worse and symptoms indicative of dangerous processes have developed: in addition to the case of Frick, already cited—operation on the fifth day, recovery—I will mention that of Priddy, in which the operation was done 108 hours after the wound had been received, and showed a wound of the colon six inches long; a wound of the mesentery and of the jejunum, and in addition a considerable quantity of bloody serum and pus in the abdominal cavity and well-advanced peritonitis. The wounds were closed, the abdomen washed out with warm 1:10,000 bichloride of mercury, and the cavity drained. The patient made a good recovery.

These cases are cited, not to lessen in any way the belief in the great advantage of the *early* operation, for that has been conclusively proved by the history of the first class of cases, but to show that those cases which have gone on until *dangerous symptoms* developed before they

opinion until its merits had stood the test of actual experience. A few others openly objected to the test. Dr. Arthur T. Cabot, of Boston,¹ was among the first to formulate these objections. In the course of his remarks he says: "Dr. Senn's other work in abdominal and other branches of surgery has been so full of practical suggestions that a surgeon having a perforating wound of the abdomen, and neglecting to apply a test so highly praised by him, is open to the charge of a disregard of necessary precautions, if he cannot show good reason for his neglect. Further experience may show the objections I shall state to be purely theoretical, but until this is demonstrated I shall prefer to treat wounds of the human abdominal cavity in a less experimental way."

The chief objections to the test are briefly these:

1. The test is not an "infallible" index of the condition of the alimentary canal.
2. The danger of producing infection of the peritoneal cavity.
3. It shows nothing as to the condition of other viscera, wounds of which *frequently* demand operative interference.
4. It prolongs the operation; interferes with respiration; adds to the shock.
5. It increases the liability of the sutured wounds to give way.

These objections are theoretical, perhaps, at first, but it would seem that at the present time a sufficiently large number of cases are on record to make it possible to draw some definite conclusions as to the value of this method.

In an exhaustive paper read at the International Medical Congress at Berlin, August 8, 1890, on the "Diagnosis and Treatment of Penetrating Wounds of the Abdomen,"² Dr. Senn discusses the question at considerable length, and to strengthen the argument in favor of the test, he gives in detail a report of six cases that had come under his personal observation as "A Clinical Contribution in Testimony of the Value and Reliability of the Hydrogen-gas Test in the Diagnosis of Penetrating Gunshot Wounds of the Abdomen."

Of these 6 cases, 3 recovered and 3 died. One, in which the test gave a negative result, was not operated upon, and, in spite of the fact that there was moderate hæmaturia for two or three days, the patient recovered.

In one other case that recovered, the gas-test gave a negative result, but, owing to some defect in the bag, thorough insufflation could not be obtained. The stomach and large intestine were distended, but showed no perforation. Owing to the doubt as to the condition of the small

¹ Boston Med. and Surg. Journ., 1889, ii. 81.

² Journ. of the Amer. Med. Assoc., Aug. 30, 1890, p. 311.

Treatment of Peritonitis," in which he says: "The treatment of peritonitis, following perforation of the appendix is *operative*, and no other means are for a moment to be considered. When the knife is used promptly the most hopeless cases may recover."

And still again, if further proof were needed, by the excellent contribution entitled "The Surgical Treatment of Peritonitis," read at the last Congress of French Surgeons, by Professor Demosthene (²²), of Bucharest.

Before concluding my defence of the "American method" of treating gunshot wounds of the abdomen, I will quote a few lines from a well-known French authority on this subject.

Verchère, in a most admirable and exhaustive monograph on "Wounds of the Intestine by Arms of Small Calibre," published in the *Revue des Sciences Médicales*, 1888, page 297, after having gone over the whole literature of the subject, from Hippocrates down, carefully reviewing the thesis of St. Laurens, and analyzing the cases of recovery that form the basis of M. Reclus's argument, says: "From this we conclude, with the *Americans*, that every penetrating wound of the abdomen is a perforating wound, and that every perforating wound of the small intestine is fatal, and, save with very rare exceptions, followed by death."

Referring to the cases of recovery treated by abstention, he adds: "By the same method of reasoning one might prove that falling from a seventh-story window was a comparatively trifling matter, for it would not be impossible to collect a certain number of recoveries from such an accident."

But these so-called recoveries will hardly stand the test of rigid analysis.

Of the 34 recoveries of St. Laurens, Verchère finds that only 7 can be regarded as wounds of the intestine; and, after searching through all the publications that he could find, he was able to collect only 18 recoveries out of a very large number of cases—several thousands.

In the recent experiments of Schachner, of Louisville, upon dogs, we find that in 32 cases treated by laparotomy the mortality was only 45.1 per cent., while of the 5 cases treated without operative interference only 1 recovered, and in this case there is "strong probability that very slight, if any, injury occurred."

HYDROGEN-GAS TEST.—Three years ago, rectal insufflation by hydrogen gas, as a means of ascertaining whether or not the alimentary canal had been wounded, was proposed by Dr. Senn, of Milwaukee. Dr. Senn's brilliant work in the field of abdominal surgery, both clinically and experimentally, was sufficient reason for its early recognition and almost general acceptance. While some of the more enthusiastic surgeons admitted its claim to "infallibility" without question, others were more conservative, and, while not denying its advantages, reserved their

Another very instructive case is a case of Fenger's.¹ The external wound was a little to the right on a level with the umbilicus. Thorough insufflation with hydrogen gas gave *negative* result, which, in spite of the fact that the abdomen showed a "changing line of dulness," was thought to be a sufficient reason for non-interference. The wound was dressed on the sixth day, and an area of well-marked induration found. Signs of suppurative peritonitis quickly developed. Laparotomy was performed and eight ounces of purulent fluid, having a fecal odor, were found in the abdominal cavity, along with other evidences of a well-advanced peritonitis. The patient died eight hours after the operation. The autopsy failed to disclose any perforation of the intestine, and Dr. Fenger goes so far as to cite this case as "an illustration of the proficiency of the gas-test in a case where there is no perforation," and he goes on to say, "we may safely say that one unnecessary laparotomy was prevented."

In view of the fact that of the nine cases in which the abdomen has been opened and the viscera found intact, six of the cases operated upon early recovered, while in two of the fatal cases laparotomy was not performed until the fourth and sixth days, and then for an already developed septic peritonitis, is it not possible to arrive at a different conclusion from Dr. Fenger's? The case not only "illustrates the proficiency of the hydrogen gas test," but it illustrates still more forcibly the danger in relying upon it as an index as to the necessity of operative interference. Had the wound been enlarged and cleansed, laparotomy performed, and the blood removed, there is good ground for believing the patient would have recovered. There is another source of danger in the gas-test, and that is the increased liability to septic infection. It is true that Dr. Sehn denies this, and he cites the results of a large number of experiments on dogs to prove that fecal extravasation is exceedingly rare; but the fact that ten of the eleven deaths in which the test had been used at the operation were the result of septic peritonitis, surely does not tend to lessen our fears. Much is made of the fact that hydrogen gas is aseptic. Such may be its character when it enters the rectum, but it is difficult to see how it could remain so after having traversed the intestine, and it might readily introduce into the abdominal cavity a sufficient number of germs to produce infection, without causing any *visible* fecal extravasation. While the gas-test is to be condemned as a means of *diagnosis*, there remains a field wherein it may prove a useful adjunct to laparotomy, and that is to detect perforations that might otherwise be overlooked. For this purpose hydrogen gas has no advantage over atmospheric air. Even this limited use of the gas-test has its disadvantages, and it is still open to doubt whether the risk of having

¹ Journ. Amer. Med. Assoc., July 21, 1888.

intestine, laparotomy was performed. *No wound* of the alimentary canal was found, but some blood and *pieces of clothing* were found in the abdominal cavity. It would seem that in this case recovery was due to the fact that the bag leaked, for, had the apparatus been in perfect order, the test would have shown the intestinal tract intact, and there would have been no indication for interference, the patient's general condition being (as it was) very good.

The third case of recovery happens to be the only case on record in which the intestine had been wounded (and hydrogen-gas test used). In this case thorough irrigation was employed and a drainage-tube left in the abdomen. On the fourth day a fæcal fistula appeared at the site of the drainage-tube.

I have been able to collect a series of 14 cases in which the hydrogen-gas test has been resorted to (including Dr. Burrell's case, in which air was used instead of hydrogen gas) as a means in diagnosing shot-wounds of the abdomen. A careful analysis of these cases shows that 11 cases died and 3 recovered.

The 3 recoveries were Dr. Senn's cases, and were referred to at length above. In the 11 fatal cases the cause of death was peritonitis in 10 cases, hæmorrhage and shock in 1. The total mortality in the 14 cases is 78.5 per cent.—surely not a brilliant showing.

Dr. Senn has attempted to answer the principal objections to the test, but are the answers satisfactory?

The infallibility of the test is no longer claimed, even by Dr. Senn himself, and in giving up that point the test has suffered greatly, for, if it is not *infallible*, how is the surgeon to act when it gives a negative result? The unfortunate experience of Dr. Dalton,¹ of St. Louis, in two successive cases, proves the objections to the test not merely theoretical, but painfully practical.

In one case, a careful application of the test failed to show any perforation of the stomach or intestines. Dr. Dalton said that his faith in the test was so great that he was satisfied they were uninjured. The patient died twenty-eight hours after the injury, and the autopsy showed two holes in the stomach (each one-half inch in diameter) and a large, lacerated wound of the left kidney.

In the second case the test gave positive evidence of perforation, but the distention was so great that it interfered seriously with the respiration; added to the shock, made the restoration of the intestines to the abdominal cavity almost impossible, and caused a rupture of some of the sutured wounds, causing fæcal extravasation. The patient died, and, to quote the words of Dr. Dalton, "here was a case in which Senn's method not only did no good, but absolutely did a great deal of harm."

¹ Weekly Medical Review, 1889, 23, 243.

1. *Exploratory incision* in the region of the wound to ascertain whether or not it is *penetrating*.

2. If *penetrating*, *median laparotomy* as soon as possible after the injury has been received unless suffering from severe shock.

3. Signs of a *peritonitis*, just beginning or well developed, while diminishing the chances of success, are by no means a *contra-indication* for *operative interference*.

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left an undetected perforation is not *more* than counterbalanced by the dangers arising from distending the intestines and increasing the liability of the wounds already sutured to give way.

At present the observations are too few to determine this point. Since the publication of my former paper, October, 1888, containing 74 cases of penetrating shot-wounds of the abdomen treated by laparotomy, I have been able to collect 91 additional cases, making a total of 165 cases. The greatest effort has been made to obtain all the cases that have been operated upon, without regard to result. My tables contain a large number of unpublished cases, obtained from hospital records or from personal notes from the surgeons who performed the operations.

Of the total number, 165, there were 54 recoveries and 111 deaths, giving a mortality of 67.2 per cent. Of this number there were 81 cases of wounds of the *small* intestine, with 25 recoveries, or a mortality of 67.5 per cent.; 24 cases of wounds of stomach, 6 recoveries, mortality 75 per cent.; 36 cases of wounds of colon, 12 recoveries, mortality 66.6 per cent.; 19 cases of wounds of liver, 8 recoveries, mortality 58.7 per cent.; 11 cases of wounds of kidney, 1 recovery, mortality 90.9 per cent.; 50 cases, carefully analyzed, showed a mortality of $66\frac{2}{3}$ per cent. for wounds of the small intestine uncomplicated with other visceral injuries, and 70 per cent. when other viscera were wounded.

Wounds of the stomach, liver, and colon all showed the same mortality in *uncomplicated* cases, $66\frac{2}{3}$ per cent.

In the 81 cases of wounds of the small intestine there were 439 perforations, or an average of 5.4 for each case.

Laparotomy was performed in 9 cases in which no viscera were wounded; of these 9 cases, 6 made prompt recoveries, and in 2 of the fatal cases the operation was delayed until the fourth and sixth days, and then performed with the patient *in extremis* for septic peritonitis.

There were 25 cases in which the alimentary canal was found intact; of these, 12 recovered and 13 died; mortality 52 per cent. (this includes many of the fatal kidney cases); 16 cases of resection, 3 recovered.

Hydrogen gas-tests were used in 13 cases; of these, 11 died, 2 recovered; mortality 81 per cent. (The test was used in one other case in which operation was not resorted to, and patient recovered.)

Of the total 165 cases, in only 9 instances did the operator fail to find all the perforations.

In 48 cases, where the causes of death were given, 25 were assigned to septic peritonitis, 19 to shock, 4 to hæmorrhage.

In 16 cases, where drainage was used, 6 recovered and 10 died; mortality 62.7, slightly below the average.

CONCLUSIONS.—Given a shot-wound of the abdomen, the indications are:

The structures of the lymphatic apparatus may be classified, on an anatomical basis, in three groups.¹

1. The simplest form of these structures are the minute masses, consisting of connective tissue, reticulum, or basement-substance, the meshes of which are filled with small spheroidal cells. These structures, which were first described by Arnold,² are found scattered in many of the viscera, *i. e.*, lungs, liver, and kidneys. The reticulum is exceedingly fine and delicate, and is lined by endothelium. The spheroidal cells are about the size of or somewhat larger than leucocytes, and may contain one or more nuclei. The masses are not clearly outlined, but gradually merge into the surrounding tissues.

2. Of more complex structure are certain nodules of lymphoid tissue occurring in the walls of the stomach and intestine, the so-called "solitary and agminated follicles or glands." Inasmuch as they are in no respect either follicles or glands, they are more properly called lymph nodules. The solitary nodules are little pear-shaped masses lying principally in the submucosa, and are composed of a reticular network, whose meshes are more closely arranged about the periphery. The meshes are lined with endothelium, and are filled with lymphoid cells. In the periphery is a rich network of bloodvessels and lymphatics. The bloodvessels send but a few branches into the more central portion of the nodule. They lie beneath the epithelium of the gut, through which lymphoid cells constantly pass. The epithelial covering is oftentimes thinned and excavated by pressure of the nodule upon it. Peyer's patches, or the agminated nodules, are aggregations of a number of these masses.

3. The most complex of the lymphatic structures, so complex, indeed, as fairly to merit the term organs, are the lymph nodes, often incorrectly called lymph glands. These are oval or irregular-shaped bodies, which interrupt the passage of lymph through the lymph vessels. They are surrounded by a fibrous tissue capsule, which furnishes numerous trabeculae to the interior. In the outer or cortical zone are a large number of lymph nodules furnished with cord-like anastomosing bodies, which ramify the inner or medullary portion, the lymph cords. The nodules and cords are composed of the same sort of tissue as are the lymph nodules of the intestine, except that their surfaces are covered by endothelium. Both are surrounded by a coarser reticular network containing a few lymphoid cells, the lymph sinuses. The bloodvessels, except the few branches supplying the connective tissue, ramify in the

¹ The spleen seems to belong more properly to the hæmatopoëtic rather than to the lymphatic system.

² Virch. Arch., Bd. 80, 82, 83.

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THE ANATOMY AND PHYSIOLOGY OF THE FAUCIAL TONSILS WITH REFERENCE TO THE ABSORPTION OF INFECTIOUS MATERIAL.¹

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ALTHOUGH very much has been said and written about the diseases of the tonsils, but little attention, comparatively, has been given to their normal structure and to the rôle which they play in the animal economy.

The descriptions of their minute structure in most text-books of anatomy and histology, and even in special treatises on the throat and nose, are exceedingly meagre. This would account in part, at least, for the considerable diversity of opinion which exists concerning their pathological conditions. We have little definite knowledge of their functions. Certain theories have been propounded, but none have been sufficiently conclusive as to have lead to any very general acceptance.

In view of this these studies are presented. They have involved the examination of a large number of tonsils, both human and from some of the lower animals, *i. e.*, dog, cat, rabbit, monkey, and raccoon; and they include the results of a considerable number of original physiological experiments.

The tonsils belong to the lymphatic apparatus; and in order to make the description of them more intelligible, it seems wise to review the structure of the better known lymphatic organs before describing the tonsils in detail.

¹ Being the Alumni Prize Essay of the College of Physicians and Surgeons, New York, 1890.

reported. They may be entirely absent (Salmuth¹), or, but partially developed, as in a case reported by Gould,² in which there was also faulty development of other organs. There may be an accessory tonsil (Jurasz³ and Claiborne⁴).

The development of the tonsils has been described by Kölliker⁵ and Bickel,⁶ and more recently exhaustive studies on the embryology of these structures, both human and in animals, have been made by Retterer.⁷ According to Retterer, the tonsils develop both from the epiblast and the mesoblast; the lymphoid cells being formed from the epiblast, while the bloodvessels, lymphatics, and connective framework come from the mesoblast.

They first begin to appear in man about the fourth month, and first consist of a collection of small spheroidal cells in the submucosa; at first the collection is diffuse, but gradually becomes more circumscribed. After a time the collection of cells becomes subdivided by numerous connective-tissue septa.

At the fifth month depressions in the mucous membrane begin to appear. These are the crypts, and at first consist of solid plugs of cells dipping down into the submucosa and into the collection of lymphoid cells. Later these become hollow. In the early months the mucous membrane covering the tonsil has a distinct *membrana propria*, but toward the end of gestation this disappears. At term the tonsils are fully formed.

HISTOLOGY.

The parts to be described are as follows:

1. The reticulum or stroma.
2. The cells.
3. The bloodvessels, lymphatics, etc.
4. The epithelium.

1. THE RETICULUM.—The external or attached surface is covered by a layer of fibrous tissue derived from surrounding parts. From this partially investing sheath numerous septa are given off, dividing the tonsil into a series of intercommunicating chambers. The reticulum or framework in which the cells lie closely packed is of two kinds. A, that which is found in the nodules; and B, that which forms the stroma

¹ Handb. d. path. Anat., Halle.

² Brit. Med. Journ., Oct. 16, 1886.

³ Monatschrift für Ohrenh., 1885, No. 12.

⁴ N. Y. Med. Journ., Feb. 8, 1890.

⁵ Embryologie, 1882.

⁶ Arch. für path. Anat. und Phys., xcvi. p. 340.

⁷ Journ. de l'anat. phys., etc., Paris, 1888, pp. 1-80; also Compt. rend. Soc. de Biol., Paris, 1886, pp. 536 and 581; also vol. iii. p. 27.

lymph cords and lymph nodules, while the lymph circulates in the lymph sinuses.

The tonsil corresponds more nearly in structure with a Peyer's patch.

GROSS ANATOMY OF THE FAUCIAL TONSILS.

The tonsils, two in number, are situated on either side of the mouth, between the anterior and posterior pillars of the fauces, and are more or less covered by folds of the mucous membrane. They are of a pinkish color and oval or almond-shaped. Their long axis, when the mouth is widely opened, is nearly vertical. When the mouth is closed they tend to approach one another, the long axis being more nearly horizontal. Externally they are covered by a layer of fibrous tissue derived from surrounding parts, and which serves as a partial investing sheath. They are covered by the superior constrictor muscle, which separates them from the internal carotid arteries. The internal or free surface projects into the cavity of the mouth; it is covered by stratified squamous epithelium, continuous with that of the mouth. In size the tonsils vary considerably at different ages, and in different persons of the same age. According to Sappey¹ their average vertical measurement is from 20 to 25 mm.; antero-posterior, 12 to 15 mm.; transverse, 10 to 12 mm. As a rule, they are relatively larger in childhood, as is the case with the rest of the lymphatic apparatus.

They reach their maximum size in early adult life. They afterward tend to atrophy, and in old age may become almost entirely obliterated, or converted largely into fibrous tissue.

They are composed, in general, of an aggregation of lymph nodules, separated from one another by diffuse lymphoid tissue, and arranged about a series of depressions from the surface, from eight to fifteen in number, the crypts. These crypts are lined by epithelium similar to that on the surface.

BLOOD-SUPPLY.—The following arteries supply the tonsils:

1. Branches from the dorsal artery of the tongue.
2. Branches from the inferior palatine from the facial.
3. Branches from the superior palatine from the internal maxillary.

The veins empty into the internal jugular. The nerves are, principally, from the glosso-pharyngeal; also branches from the pneumogastric, and possibly also from the spinal accessory (Balme).²

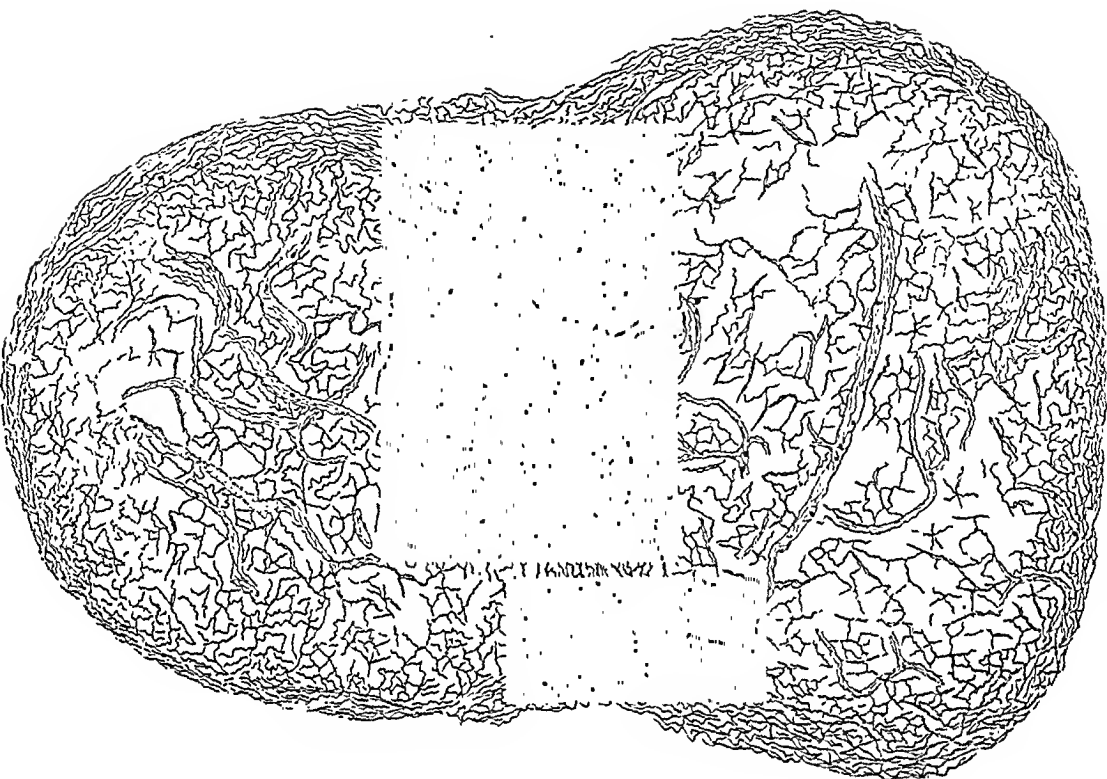
The lymphatics will be considered in the description of the minute anatomy.

ANOMALIES.—But few cases of malformation of the tonsils have been

¹ Anatomie descriptive.

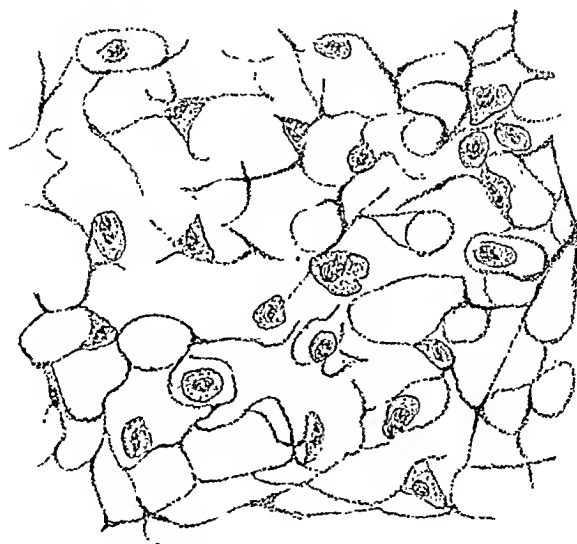
² De l'Hypertrophie des Amygdales, Paris, 1888, p. 14.

FIG. 2.



A drawing from a section of a normal tonsil from which the cells have been removed, showing the reticulum of two nodules.

FIG. 3.



High-power drawing, showing the reticular tissue of a nodule.

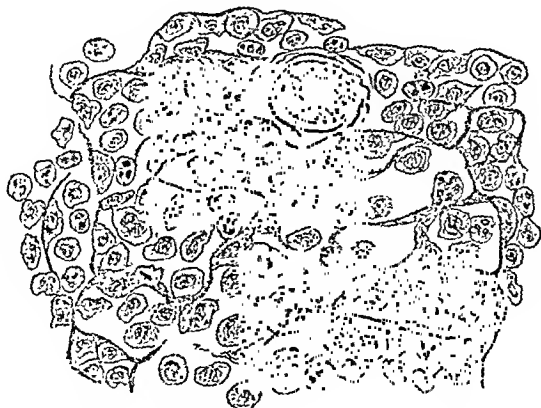


Drawing from a section of a normal tonsil from a child.

of the tissues between them. (Fig. 2.) The reticular tissue of the nodules is exceedingly fine and delicate. (Fig. 3.) The meshes are lined throughout by endothelium. About the centre the meshes are large and irregular, but toward the periphery they become somewhat

cells; but none was observed in which karyokinetic figures could be satisfactorily demonstrated. Karyokinesis, in lymphoid cells, is still a much-disputed point among histologists. The studies of Baumgarten¹ and Ribbert² seem to confirm those of the writer. On the contrary, Flemming³ and his pupils Drows⁴ and Paulsen,⁵ Peremschko,⁶ Lavodowski,⁷ Stöhr,⁸ and others claim to have observed lymphoid cells in the process of indirect cell-division. C. Large, irregular, flat nucleated cells are found in greater or less numbers in the reticular spaces. In these the protoplasm, which is surrounded by an investing membrane, is granular, the nuclei are relatively large, round, or oval, and sometimes contain nucleoli. The intra-nuclear network is distinct, and often karyokinetic figures can be made out. The origin of these cells was for a long time undetermined. It can no longer be doubted that they are derived from the endothelium lining the reticulum. Under normal conditions, but few such cells within the meshes are usually seen; but in diseased conditions, when increased desquamation of the endothelial lining takes place, they become especially numerous. (Fig. 5.)

FIG. 5.



High-power drawing showing the lymphoid cells and the reticular tissue.

The reticulum forming the framework of the nodules is more closely packed with cells than is that which separates the nodules from one another. Such an arrangement gives to the nodules a denser appearance, but no difference could be detected in the character of the cells

¹ Zeitschr. f. klin. Med., Nos. ix. and x.

³ Arch. f. Mik. Anat., Bd. 24.

⁵ Ibid., Bd. 24, p. 345.

⁷ Virch. Arch., xvi.

² Ziegler's Beiträge, 1889, p. 185.

⁴ Ibid., Bd. 24, p. 338.

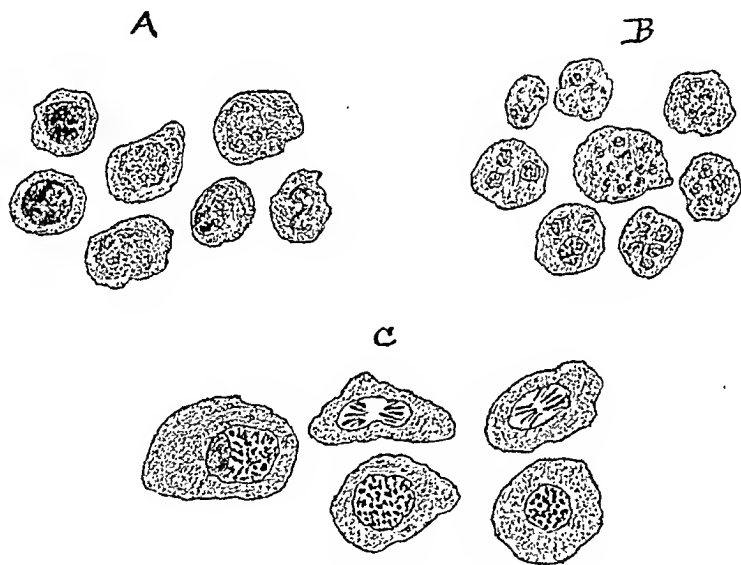
⁶ Ibid., Bd. 17.

⁸ Ibid., xvii.; also Ueber die Peripheren Lymphdrüsen, Separat-abdruck aus den Sitzungsberichten in Würzburg, 1883.

coarser and more closely arranged, and finally become merged into the relatively coarser reticulum between the nodules. This form of reticulum contains no connective-tissue cells, and although it is usually described as being composed of connective tissue, it seems more properly to belong to a different variety of tissue. It may be called reticular tissue in contradistinction to the connective-tissue reticulum between the nodules. This last-mentioned form of reticulum differs from that just described, in that it is evidently derived from the fibrous-tissue septa. It is coarser and more closely arranged than the reticular tissue of the nodules, but the meshes are lined by endothelium. About the periphery the varieties merge into one another.

2. THE CELLS.—Three varieties of lymphoid cells, which almost completely fill the reticular network, may be distinguished. (Fig. 4.)

FIG. 4.



The cells which occupy the reticular network.

A. The majority of the cells are of a spheroidal or irregular shape from 5 to 8 μ in diameter, containing a single nucleus from 2 to 4 μ in diameter. The nuclei are either of a homogeneous or finely-granular character, and occasionally contain vacuoles. No distinct limiting cell-membrane can be detected. B. The cells of this group differ from those of the preceding, in that they are multinuclear. The nuclei vary in number from two to four in a single cell. These closely resemble leucocytes, and the relative number of the two varieties differs a good deal in different sections. As a rule, the mononuclear are vastly more abundant than the polynuclear cells. A large number of specimens were carefully examined with reference to cell-division in these

Lymphatics.—Injections of colored gelatin or solutions of nitrate of silver show that the lymphatic network occupies the whole of the tonsillar mass. The lymphatics constitute a series of closed canals in which the lymphoid cells lie, lined by endothelium, and probably they do not open into the reticular connective tissue, either by stomata or open extremities.

From these lymph channels the lymph is collected by several lymph vessels, provided with valves at the base of the organ. These penetrate the basal capsule and connect with the lymphatics at the base of the tongue, which in turn finally enter the lymph nodes at the angle of the jaw, about at the level of the hyoid bone.

Nerves.—The manner of termination of nerve-filaments in the tonsils could not be determined, since repeated attempts to demonstrate nerve-fibres in them failed in each instance. Aside from nerve-filaments supplying the sheaths of bloodvessels, the presence of nerve-fibres has not yet been demonstrated in the other lymphatic structures.

4. EPITHELIUM (Fig. 7).—The tonsil is covered on its free surface by stratified, squamous epithelium, continuous with that of the mouth. In the fully-developed tonsil there is no *membrana propria* separating the epithelial cells from the underlying tissue. It differs in appearance and arrangement in different parts. In places it presents a uniform layer of from eight to twelve cells in thickness, and is arranged in three layers; the cells of the outermost being flat and scale-like, those of the middle polygonal and “spined,” while those of the inner layer are cuboidal in shape. In other parts, while the arrangement of the cells remains the same, the contour is made irregular by projections upward of the submucosa giving an appearance not unlike the rete Malpighii of the skin.

Such is the usual arrangement of the epithelium of mucous membranes in general. The epithelium of the tonsils, however, and also that covering the solitary and agminated lymph nodules of the intestine, present still other appearances, the result of peculiar alterations in the cells themselves. In such situations, the epithelial cells are diminished in size and are very much altered in shape. The cells now become either cylindrical, irregular, spindle- or star-shaped, and many of them are furnished with long, branching processes, which are apparently continuous with the underlying connective-tissue reticulum. Furthermore, little hollow cavities are found in the epithelial layer, usually near the surface. These cavities contain numbers of lymphoid cells and sometimes are closed on all sides; but sometimes they are provided with minute channels leading to the surface, through which lymphoid cells may be seen to pass.

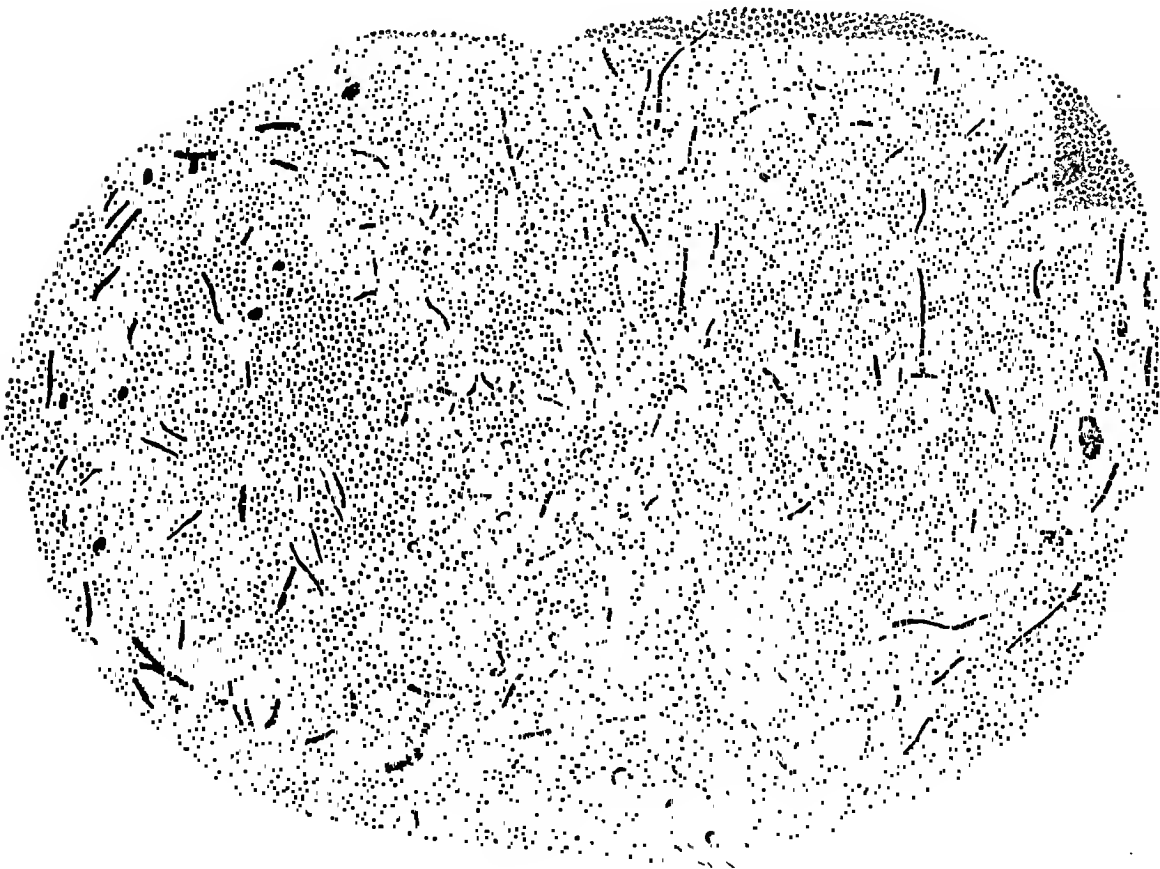
This alteration, which Zawarykin¹ calls a process of “rarefaction of

¹ Zawarykin: *Anatom. Anzeiger*, 1889. No. 15, p. 467.

in the nodules from those between them. As was shown by serial sections the nodules are arranged concentrically about the crypts.

3. BLOODVESSELS (Fig. 6).—The larger trunks after entering the tonsil are surrounded by fibrous tissue sheets derived from the basal capsule. The fibrous tissue about the larger vessels would tend to interfere with their contraction and closure when cut; and this anatomical arrangement seems to afford an explanation for the hæmorrhage which sometimes follows cutting operations involving removal of large

FIG. 6.



Drawing from an injected specimen showing the distribution of the bloodvessels.

parts of the tonsil. The larger trunks rapidly divide into smaller branches, which ramify in the tissue between the nodules. As was shown by injected preparations, the nodules themselves are but scantily supplied with bloodvessels; and these, as a rule, are principally confined to the periphery. Beneath the epithelium in the submucosa the blood is collected in small veins, whence it is returned to the larger veins at the base, and is finally emptied into branches of the internal jugular.

the epithelial covering is so thin as to be but one or two cells in thickness. (Fig. 8.)

"Rarefaction of the epithelium" occurs in both healthy and diseased tonsils. Serial sections show it to be of very irregular distribution; and it has apparently no direct relation with the lymph nodules. As yet its physiological significance has not been made quite clear. It greatly facilitates the passage of lymphoid cells from the tonsil to the cavity of the mouth; and it has, I believe, an important bearing upon the absorption of bacteria and their ptomaines, and in the production of certain of the acute infectious diseases.

The crypts penetrate the substance of the tonsil, generally at right angles to the surface, but sometimes more obliquely. Their number varies from eight to fifteen in a single tonsil. Usually they are single, but they may divide into two or more branches. They vary in depth and in the size of their lumina, and are lined by stratified squamous epithelium. The contents of the crypts consist of emigrated lymphoid cells, desquamated epithelium, granular matter, cholesteroline crystals, bacteria, and occasionally particles of food.

In almost every section, a varying number of small spheroidal cells are found between the epithelial cells. As long ago as 1836 "emigration of white blood-cells" was described by Valentin.¹ Since then the process has been carefully studied by a great many observers. Stöhr² has studied this emigration of leucocytes more especially in the tonsils. In all cases, but more especially in tonsils of young persons, a large number of cells similar in structure to those found in the substance of the organ, are continually finding their way through the epithelial covering to the surface or into the lumina of the crypts.

It will be seen, from the above description of the faucial tonsils, that in structure and in the manner of distribution of the bloodvessels and lymphatics, they closely resemble the agminated lymph nodules or Peyer's patches of the small intestine. Except for the crypts, the structure of the tonsils is, indeed, identical with that of a Peyer's patch.

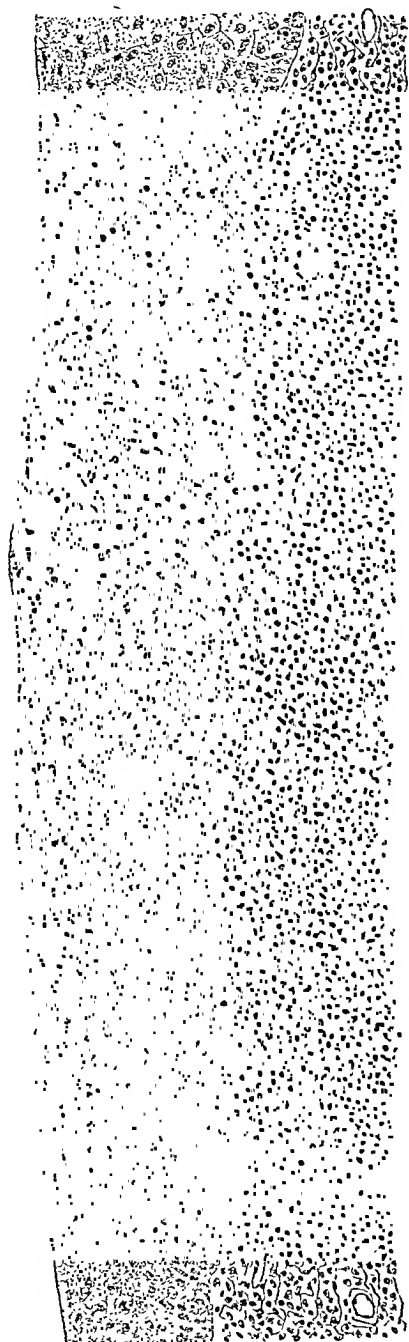
COMPARATIVE ANATOMY.—The tonsils of those animals which were examined were found to be of an essentially similar structure as in the human variety; but in the different species a good deal of difference was observed in their shape and gross appearance.

In monkeys the tonsils differ but little, except in size, from those in man. In dogs, the tonsils are relatively large and spindle-shaped. The long diameter is about four times that of the transverse. The dog's tonsil is folded upon itself, so that it presents a deep fissure, on the surface, which extends from either extremity along the upper and outer

¹ Repertorium für Anatomie und Physiologie. 1836, p. 253.
Ar. h. f. Path. Anat. und Phys., xcvi.

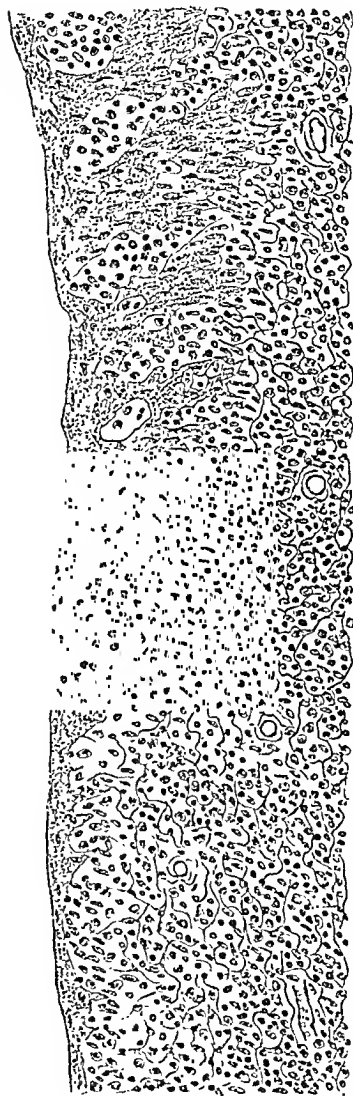
the epithelium," seems to be the result of pressure from beneath upon the epithelial lining. It causes a great irregularity in the contour of the

FIG. 7.



The epithelium covering the tonsil, showing emigration of lymphoid cells and rarefaction.

FIG. 8.



The epithelium covering the tonsil, showing an advanced stage of rarefaction.

epithelial layer, which is also considerably diminished in thickness. In other parts, where these changes have advanced to a still greater degree,

some of the smaller bloodvessels with the hypodermic needle, with the result of obtaining a mixed injection. The bloodvessels are easily injected with blue gelatin, artificially through the carotids; or a very good natural injection may be made by suspending the animal before it is killed, by the hind-legs, and hardening the tonsils immediately after they are removed, in strong alcohol.

PHYSIOLOGY.

As has been stated elsewhere, in this paper, our knowledge of the functions of the tonsils is largely theoretical, as nothing seems to have been done thus far by way of experimentation toward the solution of this problem. Indeed, the physiology of the other lymphatic structures, in spite of all the careful research which has been accorded them, is but little understood.

The unsatisfactory state of our knowledge of the functions of the lymph nodes, for example, is well shown by this statement of Foster.¹ "Obviously here, as in the lymphatic follicles of the intestine, the adenoid tissue or lymphatic substance is the seat of an interaction between the blood and the lymph: here the blood gives something to and takes something from the lymph, or, at least, is in some way changed; here the lymph takes from and gives up to the blood. We may be confident that these changes take place, though our knowledge as to the exact nature of these changes is at present very limited."

Studies in pathology indicate that the lymph nodes act as filters. Thus particles of pigment, bacteria, and cells from neoplasms, which have gained access to the lymph channels, are apt to be caught and held in the lymph nodes.

The bronchial lymph nodes succeed, in most cases, in holding back from the general circulation the particles of inhaled pigment which may have been absorbed by the lungs. Living bacteria, or cells from neoplasms, which still have retained vital properties, when they become lodged in the lymph nodes may incite inflammation, or set up new-growths.

It is almost certain that the lymph nodules of the intestines, especially Peyer's patches, are concerned in the absorption of the products of digestion. A certain amount, though but an insignificant proportion of fats, at least, is absorbed by these bodies. (Schäfer.²)

The functions of the little masses of lymphoid tissue scattered about in the substance of the thoracic and abdominal viscera are totally unknown.

The studies on the physiology of the tonsils, which I have made,

¹ Handbook of Physiology, London, 1889.

² Journ. Internat. Anat. und Histol., 1885, Bd. ii. p. 16.

aspect of the organ. Into this fissure most of the crypts empty; the few remaining crypts empty on the free surface.

The tonsils are but little encroached upon by the pillars of the fauces; and they are very thoroughly exposed to view when the mouth is opened and the tongue is forcibly drawn forward. Consequently, these animals are especially applicable for physiological experiments.

In rabbits, the tonsils are hemispherical in shape and present a single crypt at the centre, about which the lymph nodules are arranged in rows.

In cats the tonsils are pear-shaped, and lie in a pocket of fibrous tissue in which they are freely movable. Only a small part of the organ protrudes, through a small circular opening in the mucous membrane, into the mouth.

TECHNIQUE.—Specimens, for histological study, are better preserved when treated with corrosive sublimate solution, than are those which have been hardened, directly, in alcohol or in Müller's fluid. Any of the many formulæ of sublimate solution may be employed, of which Lang's is, perhaps, the best, consisting of water 1000 c.c., corrosive sublimate 8 grm., hydric acetate 8 c.c. Small bits of perfectly fresh tissue are placed in this solution. After one hour they are washed in water, and hardened successively in 40 per cent., 60 per cent., 80 per cent., and in strong alcohol. By means of double imbedding in both celloidin and paraffine, exceedingly thin sections may be cut, which, provided all the sublimate has been removed, stain readily in any of the more commonly employed staining reagents.

The reticulum is best studied in sections from which most of the cells have been removed. This may be accomplished in several ways. The most satisfactory way is to make frozen sections from specimens which have previously been hardened for from one to two hours in one-third alcohol. The sections are gently shaken in a test-tube of water, care being taken not to continue the shaking too long. The sections are stained on a slide and mounted on glycerin. The outlines of lymphoid cells are best preserved by teasing a bit of the fresh tonsil in a mixture of equal parts of osmic acid, 1 per cent., and normal salt solution.

None of the methods of demonstrating the lymphatics of the tonsil are altogether satisfactory. Ranvier's¹ method consists in injecting a small quantity of blue gelatin into the substance of the organ just beneath the epithelium, and allowing the specimen to cool before it is hardened in alcohol, and cut into sections. Solutions of nitrate of silver, 1 : 500, are also recommended in place of the gelatin. While this method is applicable with the lymph nodes, in the case of the tonsil it has, thus far, always been the misfortune of the writer to puncture

¹ D'Histologie. Paris, 1875, p. 674.

Landois states that under ordinary circumstances absorption from the mucous membrane of the mouth is very slight, although sufficient is absorbed to enable the sense of taste to be perceived, and applications of powerful drugs may be followed by systemic effects. I verified this statement by applying a solution of atropine to the mouth of a healthy person and watching its effect on the eyes. Although the solution employed was a strong one, and the application continued thirty minutes, and the drug was distinctly tasted, no dilatation of the pupils followed.

1. The tonsils of several animals, as well as the whole of their buccal cavities, were kept constantly smeared with olive oil, in one set of experiments; in a second set, melted lard was used, and in still a third, lanolin. After from fifteen to thirty minutes the animals were killed, and the tonsils, together with portions of the tongue and pharyngeal wall of each animal, were hardened in osmic acid one per cent. and alcohol, and examined microscopically. The epithelial covering of the tonsils contained a few fine, black granules (fat droplets), generally near the surface. The granules seemed to be between the cells. There was no fat, either in the lymphoid cells, or lying free between them. Sections of the tongue and pharyngeal wall from each animal showed a few fat globules in the superficial portions of the epithelial covering.

2. Finely-powdered carmine, Berlin-blue, and emery powder suspended in water, were applied to the mouths and tonsils of dogs, in a similar manner as were the fats.

Microscopical examination in each case failed to demonstrate the absorption of any of the insoluble material in the sections of the tonsils, tongue, or pharyngeal wall.

3. Solutions of anilin colors in water, and in normal salt solution, salts of iron, and strong solutions of atropine, were kept in contact with the mucous membrane of the mouth and tonsils for from fifteen minutes to one hour. In none of the experiments in which colored solutions were employed did absorption, as was demonstrated by microscopical examination of frozen sections, take place.

The tissues which were subjected to the action of ferrous sulphate were afterward placed in a solution of ferric cyanide of potassium. Sections of these specimens failed to show granules of Berlin-blue in the epithelium or in the deeper structures. The dogs to whose tonsils strong solutions of atropine were applied, showed no dilatation of the pupils after the application had been continued for one hour.

4. Solutions of anilin colors and mixtures of insoluble carmine in water were injected beneath the mucous membrane in the neighborhood of the tonsils in different animals, which were killed one hour afterward. In neither case was the coloring matter taken up by the tonsils.

5. A small quantity of a strong solution of atropine (one-sixth gr.) was injected into a dog's tonsil immediately beneath the mucous mem-

were done, more especially, to determine their relations to some of the acute infectious diseases. Before entering upon a discussion of this subject, it will be necessary to consider some of the theories which have been advanced to explain the functions of these organs.

Perhaps one of the oldest of these theories is, that the tonsils are secreting organs, furnishing a thick, viscid mucus which lubricates the bolus of food during the second part of the act of deglutition, and which also lubricates the back part of the mouth and pharynx.

Such a theory is abundantly discredited on purely anatomical grounds. The secretion of mucus is furnished by the numerous mucous glands in the adjacent mucous membrane, and not by the tonsils themselves.

The old idea of Perrin, that the tonsils were concerned in the formation of the voice, seems highly improbable. A connection between the tonsils and the organs of the genital apparatus has been suggested. This notion is more a popular one, and is without scientific foundation.

More recently Hill,¹ Spicer,² and Hingston Fox,³ reasoning from analogy, have advanced the idea that the tonsils reabsorb the waste secretions of the mouth and pharynx. According to these authors, especially the digestive ferments of saliva are absorbed by the tonsils in order to prevent waste. Although this theory did, at first, seem plausible, no attempt was made to strengthen it by actual demonstration.

The physiological experiments which I shall describe later show Hill's theory of the functions of the tonsils to be wholly unsupported by facts.

Recent observations have shown that pathogenic bacteria may be present in the mouths of healthy individuals, often in considerable numbers, and an intimate connection between the tonsils and some of the acute infectious diseases has long been supposed to exist. Moreover, it was thought not to be unlikely that infection, in some cases, may take place through the tonsils.

In order, if possible, to throw some light on this most important problem, I have endeavored to ascertain the amount of absorption which, under favorable conditions, may take place through the tonsils. Experiments were done on dogs and rabbits. In most cases the experiments were repeated, and as far as possible controls were made in each case. The experiments consisted in attempting to cause the tonsils to absorb various materials which could be afterward recognized, microscopically, in the tissues; and according to the nature of the materials used and the manner in which they were applied, the experiments may be divided into several groups.

¹ British Medical Journal, 1888, vol. ii. p. 615.

² Lancet, London, 1888, vol. ii. p. 805.

³ Journal of Anatomy and Physiology, London, 1885-6, vol. xx. p. 559.

From the results of these examinations it would seem probable that :

1. Tubercular tonsillitis is a rare affection.
2. The tonsils are rarely, if ever, the site of primary inoculation in pulmonary tuberculosis.

Whatever may be the physiological significance of rarefaction of the epithelium of the tonsils, it, together with a knowledge of the nature of the lesions of diphtheria of the tonsils, unquestionably affords a ready explanation of the way in which these structures become infected in this disease. We have seen that rarefaction of the epithelium is of constant occurrence in the tonsils; that as a result of this process parts of the epithelial covering are very considerably diminished in thickness, not infrequently so decidedly thinned as to be, in certain places, but one or two cells in thickness. Now, as a result of the presence of the contagium of diphtheria, which acts as an irritant to the cells, increased desquamation of the epithelial covering takes place. This proliferation of the cells, as I have actually observed in sections of diphtheritic tonsils, may entirely denude the tonsil of its epithelial covering in places; and the specific virus of the disease is thus brought into immediate contact with the lymphatics of the tonsils, from whence it is carried into the general circulation.

RECAPITULATION.

1. The tonsils are lymphoid structures closely resembling the Peyer's patches of the small intestine, consisting in general of a congeries of lymph nodules separated from one another by diffuse lymphoid tissue, which are arranged about several hollow depressions of the epithelial covering, the crypts.

2. None of the theories thus far advanced to explain the functions of the tonsils are conclusive.

3. The tonsils produce no physiological secretion.

4. The tonsils are not absorbing organs. They neither absorb fluids or solid particles from the mouth under ordinary conditions, nor do they take up foreign materials from the tissues in their immediate neighborhood.

5. Tubercular tonsillitis is an uncommon affection.

6. There is no evidence to show that pulmonary tuberculosis ever results from absorption of tubercle bacilli from the mouth through the tonsils.

7. Rarefaction of the epithelium of the tonsils affords a ready explanation of the way in which the contagium of diphtheria may gain entrance to the general circulation in this disease.

brane, care being taken that none of the fluid escaped into the œsophagus. Within a few minutes the pupils became widely dilated, and soon afterward the dog became very drowsy, and finally was unable to stand.

6. Small quantities of both soluble and insoluble pigment were injected into the substance of dogs' tonsils, and the animals were killed one hour afterward. Upon examination the pigment was found to have collected in the spaces between the nodules, where the point of the needle was carried. It showed but little tendency to diffusion. None of the pigment had been gotten rid of by the surface or was found within the crypts.

SUMMARY OF ABSORPTION EXPERIMENTS.

The experiments just described were done with care, and, as far as possible, all sources of error were eliminated. The results seem to show that in healthy tonsils under ordinary conditions :

1. Soluble or insoluble materials are not absorbed by the mucous membrane of the mouth, or pharynx, or by the tonsils, except to a very slight extent.

2. It is the epithelial covering which prevents absorption taking place by the tonsils. Substances in solution which have found their way beneath the epithelium may be rapidly taken up by the lymphatics and carried into the general circulation.

3. Soluble and insoluble foreign materials in the tissues in the immediate neighborhood of the tonsils are not readily and at once taken up by them.

4. Soluble and insoluble foreign materials in the substance of the tonsils are not thrown off by the surface; but may either remain in the tissues or may be carried off by the lymphatics to other parts of the body.

Baumgarten has suggested that the tonsils might be the point of entrance of tubercle bacilli into the body; that tubercle bacilli which may have been taken into the mouth may be absorbed by the tonsils, where they may result in the formation of miliary tubercles. From thence, Baumgarten supposes, infection may spread through the lymphatics to the bronchial lymph nodes and finally to the lungs. In order to determine the relative frequency of tubercular lesions of the tonsils, and to ascertain the relationship, if any, of these structures to pulmonary phthisis, I have examined, microscopically, a large number of tonsils (nearly 200) for evidences of tubercular lesions. These tonsils were from persons of all ages; and they include the tonsils from eighteen persons who died of pulmonary phthisis. In but one case out of the entire number examined were the tonsils tubercular. In this case they were removed from the body of a man who died of very general tuberculosis.

evaporation, and to possible carelessness in selection of parts for the first examination.

Case XIX. presents the remarkable statement that no tubercle bacilli were present at the first examination, while they were most easily found in every preparation at the second. The only possibility of error which could have been made in this case arose from the fact that, at the first examination, only four cover-glasses were looked over. The clinical history, as derived from the hospital records, shows that the patient left the hospital with well-marked signs of tuberculosis.

From the winter of 1886-87 until December, 1889, a period of nearly three years, the various specimens of sputa remained upon the laboratory shelves quiet and undisturbed. In the meantime all the aqueous portions had disappeared, and there remained in some cases only a little dry dust about the edges of the glass jars, while in one or two cases there was a hard, dry, brown crust covering the whole bottom of the jar. To prove the presence of the tubercle bacilli, four examinations were made in the following manner:

A drop of distilled water was put upon a cleaned and sterilized cover-glass, and then a bit of the dust or crust removed with a platinum needle rubbed over the cover-glass; usually the crusts would dissolve easily. Any crumbs were removed, the water evaporated, and the specimens stained by Ziehl's method.

No. of case.	Date of first examination.	Remarks.	Date of second examination.	Remarks.
XIV.	Jan. 8, 1887	Few.	Dec. 7, 1889	Very few
XVII.	Dec. 15, 1886	Small number.	Dec. 11, 1889	Small number.
XX.	Feb. 9, 1887	Very numerous.	Dec. 11 1889	Very numerous, long, beaded, or in clumps.
XXIV.	Jan. 5, 1887	Numerous.	Dec. 11, 1889	Numerous.

Practically no other bacteria were present, though usually almost all sputum is especially rich in many forms of bacteria. The bacilli took the stain beautifully, and appeared as bright red as though they had been stained from a fresh specimen.

Having demonstrated the presence of the bacilli in sputa kept for three years, the next thing was to prove their virulence.

December 11, 1889, six rabbits were taken and two were inoculated with a mixture of the sputum dust in sterilized water from each of the following cases: XVII., XX., XXIV. The inoculation was made beneath the skin of the abdomen. At the end of forty days, three of the rabbits were killed, and the result of the autopsies was as follows:

CASE XVII.—At the point of inoculation a small tumor two-thirds of an inch in diameter, filled with a white semi-fluid substance, the con-

WHY THE SPUTA OF TUBERCULOUS PATIENTS SHOULD BE DESTROYED.

AN OBSERVATION ON THE VIABILITY OF THE BACILLI OF TUBERCULOSIS.

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DURING the winter of 1886-87 I became interested in the growth and longevity of the tubercle bacillus, from the statement of a Washington gentleman that he had noticed a decided increase in the number of the tubercle bacilli in sputum which had been kept standing at the ordinary room temperature. (This was simply a verbal statement, and to my knowledge has never been published.)

In order to verify this, a number of jars containing tuberculous sputum were set aside and examined after a period of about three months. The result of the examination was as follows:

No. of case.	Date of first examination.	Remarks.	Date of second examination	Remarks.
XIV.	Jan. 5, 1887	Few found.	April 15, 1887	Same number.
XVII.	Dec. 15, 1886	Small number.	April 15, 1887	Numerous, very numerous, even in masses.
XVIII.	Nov. 17, 1886	None.	April 15, 1887	None.
XIX.	Nov. 19, 1886	None.	April 15, 1887	Numerous.
XXV.	Jan. 5, 1887	Small number; one cover 3, one had only a very few (7 covers).	April 15, 1887	Small number, but easily found in 8 covers.
XXVIII.	Jan. 7, 1887 Cystitis.	Small number.	April 18, 1887	Very few other bacteria, number about the same as in previous examination.
XXIX.	Jan. 10, 1887	None.	April 15, 1887	None.
XXX.	Jan. 19, 1887	Small number in every field.	April 15, 1887	Small number to numerous; very few other bacteria present.

Examination of this table would simply go to prove that for a period of three months the tubercle bacilli remained in sputa retaining their power of taking stain and so presumably alive and virulent.

Case XVII. shows an increase from "small number" to "very numerous." Reference to notes of this case shows that in the examination of Dec. 15th five covers were examined, of which four were marked as "small number" and one "numerous." April 15th eight covers were looked through; two were marked "small number," two "numerous," four "very numerous"; and at the end of the note, "some masses, and where the preparation is well made the bacilli are present in great quantities." But on the whole, I am inclined to believe that the change was simply due to the increased density of the sputum, caused by

CASE XXIV.—All the internal organs were normal. At the point of the first inoculation was a nodule (2 x 2 cm. in diameter). Cover-glass preparations made from the contents showed the presence of a few bacilli. In this case there had always been some doubt whether any of the inoculating fluid had entered the abdominal cavity on account of the leakage of the syringe.

Although the re-inoculation of an animal is a slightly irregular proceeding, yet in this case it is one to which no exception can be taken. The second inoculation simply increased the *dose* of tubercle bacilli, and at the same time put them in a more favorable condition for absorption. The result goes to prove that the bacillus of tuberculosis is not only capable of receiving staining material, when three years old, even though the medium in which they were suspended had been reduced for a period of more than two years to absolute dryness, but that it is also surely alive and virulent. The virulence, to be sure, seems to have been modified by the general drying process, so that the animals were capable of resisting to a much greater degree than usual the poison when introduced.

Another interesting point is in regard to the life-history of the tubercle bacilli. The bacilli, during all the process of drying, had managed to keep their original form and condition, and had not undergone spore-formation. Such, at least, is the fair inference to be drawn from the fact that all other forms of bacteria had disappeared from the sputa dust, while the tubercle bacilli remained and appeared as fresh as though coming from a recent specimen of sputum.

The practical importance of this observation is simply to emphasize the need of the destruction of the sputa of all phthisical patients. The elaborate and painstaking article of Cornet¹ put beyond the shadow of a doubt the fact that a large part of the present widespread tuberculosis was due to the constant exposure of persons who were in a state of low physical condition, or minimum resistance to inoculation with tubercle bacilli to pulverized sputa of tuberculous subjects. Bearing this fact in mind, and adding the results as above obtained, that the dried tuberculous expectorations can remain for a long time—namely, three years—virulent, the practising physician can see the great importance of the destruction of all sputa which may contain the tubercle bacilli.

Experimenters and investigators have all pointed the profession in the same road. There has been no clash, no conflicting statements, and to-day practically everyone agrees to the infectious nature of tuberculosis. But, as Dr. Shakespeare said in closing the discussion on his able paper upon the subject, "What can and should be done to limit the prevalence of tuberculosis in man?"²

¹ Zeitschrift für Hygiene, B. v., 1888.

² Transactions of the Association of American Physicians, 1890.

sistency of very thick cream. Peritoneum, liver, spleen, and lungs normal. Cover-glass preparations were made from the contents of the tumor, and a few tubercle bacilli were found. Sections of the tumor made later showed no tubercle bacilli.

CASE XX.—Animal much thinner than when inoculated. A slight thickening was present at the point of inoculation with semi-fluid contents. Peritoneum, spleen, and lungs were normal; liver had several white nodules size of the head of a small pin. Cover-glass preparations from the contents of tumor at point of inoculation showed a few bacilli, though rather questionable in character and not well stained. Section of the liver nodules showed the presence of the coccidia oviformi.

CASE XXIV.—Nothing at the point of inoculation. Abdominal cavity more œdematous than usual. Peritoneum, spleen, and lungs were normal. Few white nodules in liver, which showed no tubercle bacilli on section.

The results thus far prove nothing, as the few tubercle bacilli found might have simply been some which were put under the skin at the time of the inoculation in December. The three remaining rabbits were again used and inoculated with the same mixtures as before, but this time the inoculation material was put into the abdominal cavity, the previous experiment having proved that there was no danger of septic infection. The second inoculation took place February 2, 1890, and the rabbits were killed March 28th.

CASE XVII.—The seat of the first inoculation showed a small cyst with a few drops of semi-fluid substance, from which cover-glass preparations were made.

On opening the abdominal cavity, a white nodule (1 x 1.5 cm.) was found adherent to the abdominal wall at the point of inoculation. Another large mass lay in, and adherent to, a fold of the larger intestine. Several other smaller nodules were found at various parts of the omentum. Other organs normal. All these nodules had semi-fluid white contents, and of this cover-glass preparations were made with the following results: From the old seat of inoculation, tubercle bacilli lying in clumps of three or four; from mass in side of abdominal wall, four cover-glasses, all showing presence of tubercle bacilli; from the large nodule, several scattered bacilli and one clump of six or eight; from omental nodule, a clump of undoubted bacilli.

CASE XX.—Slight cyst at point of old inoculation; cover-glass preparations from the contents were made. No signs of general peritonitis, but adherent to the large intestine and the mesentery were numerous nodules the size of a pea, and having the general appearance of fat. Section, however, showed them to be cystic, and filled with soft, white material from which cover-glass preparations were made. Lungs were normal. The liver contained several small white nodules, which, however, had the appearance of coccidia. Spleen contained one small white nodule. The cover-glass preparations from the cystic growths showed the presence of the tubercle bacilli, few in numbers, but perfectly distinct. Six preparations from the contents of the old inoculation growth all showed the presence of the tubercle bacilli.

REVIEWS.

A MANUAL AND ATLAS OF MEDICAL OPHTHALMOSCOPY. By W. R. GOWERS, M.D., F.R.S., Fellow of the Royal College of Physicians, Consulting Physician to the University College Hospital, Physician to the National Hospital for the Paralyzed and Epileptic. Third edition, revised throughout with numerous additions and additional illustrations. Edited with the assistance of MARCUS GUNN, M.B., F.R.C.S., Surgeon to the Royal London Ophthalmic Hospital, Moorfields; Ophthalmic Surgeon to the National Hospital for the Paralyzed and Epileptic.

THE first edition of Dr. Gowers's *Manual of Ophthalmoscopy* quickly attained a front rank among standard medical works, a position it always has retained, and now more firmly than ever has secured by the appearance of a third revision, rendered especially valuable by the able assistance of Marcus Gunn. In spite of the fact that this edition contains most of the important new observations which have been recorded since 1881, the bulk of the volume has not been increased. This has been accomplished by rewriting many paragraphs in a more condensed style, and by substituting brief epitomes for the extended descriptions of illustrative cases which appeared in earlier editions. Another important change is the insertion through the text, in connection with the subjects to which they refer, of the microscopic figures which formerly were presented on photo-lithographic plates. An excellent addition is the appendix, devoted to a description of how best to sketch the fundus oculi. This is composed of two portions—in one the method of making a pencil-drawing of the ophthalmoscopic picture is described; in the other most acceptable remarks on the production of colored plates are offered. In addition to the thorough revision which almost every page has received, certain entirely new sections have been added. For example, we find one short article on the ophthalmoscopic changes seen in diseases of the nose—a subject which has recently attracted no little attention. This refers only to the remarkable series of cases of disease of the optic nerve associated with a persistent discharge of watery fluid from one nostril, but might with propriety have included the observations of Ziem and others upon the relations between nasal disease and retinal hyperæmia with limitations in the field of vision. No doubt a subsequent edition will require a paragraph upon "Diseases of the Bones," and a description of Jonathan Hutchinson's types of serpiginous choroiditis seen with osteitis deformans. We much wish that Dr. Gowers had written somewhat upon the ocular manifestations of influenza, in so far as these belong to medical ophthalmoscopy, and given us the benefit of his skill in winnowing the chaff from the wheat.

Occasionally, the work of revision seems not to have included certain

“What use was it for Koch to have made his discovery of the infectious nature of the bacillus tuberculosis, if the practitioners of medicine, those who come in direct contact with the people, who are the natural agents for arousing such a public sentiment and enforcement of laws for the protection of public health, utterly neglect to act upon the ample and exact knowledge which we already possess concerning the etiology and prophylaxis of tuberculosis?”

And it may be added that the value of such careful work as that of Cornet and others, and the value of such a single small observation as the one recorded in this paper is entirely lost, if the practising physicians do not set themselves to work to do their part toward eradicating this great public danger.

This is hardly a paper in which to enter into details of how prophylaxis should be carried out, but at the same time a few hints may not be entirely out of place. All rooms which have been occupied by tuberculous persons should be most thoroughly cleansed before allowing them to be used again. As the best means to accomplish the destruction of the sputa, the physician should tell both the patient and the family of the danger which lies hidden in the expectoration. And then he should insist that all the expectoration shall be destroyed. In the houses of the rich, it is very easy to provide the small paper sputa cups which can be burnt, and thus absolutely destroy the bacilli. Poor people can be made to use pieces of newspaper, which can be thrown into the fire and so destroyed. Fire is by all odds the best means for destruction. Corrosive sublimate solutions and carbolic acid require so long a time before they accomplish their work, that usually the cup containing the sputa is emptied before the bacilli are killed. Everyone will grant that if they are emptied into the sewer, their future harmlessness is probably insured, yet as Volsch has found tubercle bacilli after six months in a foul fluid, and as the above experiments show that the resisting power of the tubercle bacilli is very great, it will be safer to rely on fire for the absolute destruction of tuberculosis material.¹

¹ The above work was done in the Bacteriological Laboratory of the Harvard Medical School, and the paper read before the Massachusetts Medical Society, Suffolk District, Section for Clinical Medicine, Pathology, and Hygiene.

inflammation is almost invariable. That the resulting papillitis may be and remain slight, or may become intense and present the appearances of mechanical congestion. The causes of this difference we do not know. That such mechanical congestion does not, as a rule, result from the compression of the vessels in or just behind the sclerotic ring, but always, when intense, from compression by inflammatory products in the substance of the papilla. It must not be forgotten that an increase in the size of vessels may be of reflex vasomotor origin, as in all inflamed parts. "That while slow increase of intra-cranial pressure has no effect on the retinal vessels, a sudden increase hinders the escape of blood from the eye for a time, and may intensify a papillitis originating in another way. That distention of the sheath of the nerve alone is probably insufficient to cause papillitis by its mechanical effect, but may, perhaps, an irritative quality, and if (as Schmidt-Rimpler asserts and Leber denies) it can find its way into the lymphatic spaces of the optic disk." It is interesting to observe that Dr. Gowers lends the weight of his authority to the use of the term "papillitis," which word, in the opinion of one rather well-known English ophthalmic surgeon, is employed only "by exceptionally bad writers." If Dr. Gowers is an example of the "exceptionally bad writers" who have used this phraseology we wish to cast our fortunes with them.

As year by year improved knowledge and discriminating observation have placed the intelligent use of the ophthalmoscope as an aid in the elucidation of the diagnosis of constitutional diseases upon a higher plane, and the false readings of inexperienced enthusiasts have been subjected to careful revision, in which work the medical world is indebted to no one more than to Dr. Gowers, the subject of ophthalmoscopy has acquired great importance. To anyone who wishes to learn where this science stands, and exactly what relation it bears to medical knowledge as a whole, we recommend this work as by far the best that has appeared in any language.

G. E. DE S.

CONTRIBUTION A L'ÉTUDE DES PSOROSPERMOSES CUTANÉES ET DE CERTAINES FORMES DE CANCER-MALADIE DE LA PEAU DITE MALADIE DE PAGET. Par le Dr. LOUIS WICKHAM, Ancien Interne en Médecine et en Chirurgie des Hôpitaux de Paris, etc. Pp. 184, avec 4 planches hors texte. Paris: G. Masson, 1890.

A CONTRIBUTION TO THE STUDY OF PSOROSPERMOSIS AND PAGET'S DISEASE. By DR. LOUIS WICKHAM.

THIS admirable monograph is a timely contribution to a theme but recently presented for discussion and as yet but little investigated. The disease first described by Paget in 1874 and still associated with his name (eczema of the nipple and areola, and cancer of the breast, malignant papillary dermatitis of Thib) is one whose history and symptoms are to-day well recognized. Somewhat more than one year ago, however, Darier, of Paris, in a remarkable paper, called the attention of the French Biological Society to the fact that he had recognized, in

diseases. Chronic rheumatism, according to Dr. Gowers, has only accidental associations with changes in the fundus oculi. Now, while it is perfectly true that many types of inflammation of the optic nerve which have been ascribed to rheumatism are probably not correctly so accredited, it certainly is none the less true that a number of very well authenticated instances of optic neuritis, especially of the monocular type, appear to have originated directly under the influence of this dyscrasia. Parotitis is dismissed in two lines with the statement that transient dimness of sight and coincident congestion of the optic nerve have been described. The observations of Burnett in this disease, while not connected entirely with medical ophthalmoscopy, might well have been summarized. In whooping-cough we miss a reference to the cases of sudden blindness which have been reported by Alexander, and the forms of choroiditis indirectly produced by the paroxysms of coughing in this disease recorded by Nettleship and others. So many recent observations on the influence of malaria and the malarial cachexia in the production of ophthalmoscopic changes in the vitreous, choroid, and retina have appeared, notably the thesis of Lopez y Veita and the paper by Bull, that some reference to them would seem necessary. Dr. Gowers is of the opinion that slight optic neuritis is not very uncommon in chorea. He points out, however, that the frequent presence of hypermetropia would lessen the significance of this appearance in regard to the chorea were it not that the aspect of the disk in all the cases which he has observed has become normal when the chorea subsided. He makes the rather remarkable statement that in all instances of chorea which he has encountered there has been a recognizable degree of hypermetropia. Now while it is perfectly true that the vast majority of choreic children are hypermetropic, in a collection of something like 250 cases of this disease, twenty per cent. of them were found to have refraction other than hypermetropia, that is either myopia, myopic astigmatism, or mixed astigmatism. Dr. Gowers thinks that actual atheroma of the retinal vessels after death has not been found, and that appearances in the retina suggestive of its existence elsewhere are not apparent. If Raehlmann's report is true, in atheroma of the arteries of the body, especially of the cerebral vessels, a form of strangulation occurs in the retinal arteries indicative of this existence.

In a book in which practically everything is good and most of the sections above criticism, it is difficult to point out definitely those portions which seem to have most nearly attained perfection. We are, perhaps, more struck with the judicial care with which the literature of "medical ophthalmoscopy" has been employed than with anything else, and with the fact that while the student always feels after reading on any one topic that he knows Dr. Gowers's own opinion, he has not come into this knowledge by any dogmatic presentation of the theories or of the facts. One of the most comfortable chapters in the book is that on the relation of optic neuritis to encephalic disease. This begins with the first theory put forward by von Graefe, and traces the various new hypotheses and altered hypotheses which from time to time arose by virtue of new discovery and better methods of investigation, and closes this admirable review with the following conclusions:

"That in cases of cerebral tumor evidence of descending inflammation may be traced in sheath or nerve much more commonly than current statements suggest, while in meningitis the evidence of such descending

with resulting forms which are either identical with or exceedingly difficult to separate from these cyst-like bodies. The failure to reproduce these several diseases by artificial inoculation of the alleged parasites, and the unsatisfactory reports of the results of their culture and of the discovery of a special staining medium have led to a qualified acceptance only of the conclusions here presented.

The genial author of this little monograph may, however, be well congratulated on the fruit of his work. He has not merely given a most creditable report of the whole subject from the special etiological point of view which he and his friends accept, but has furnished us with the best accessible abstract of the literature of Paget's disease of the nipple which has been brought up to date. The plates added, illustrating the gross and microscopical features of the malady, are well reproduced.

His many friends in England and America will be glad to welcome this modest and painstaking contribution to science as the first-fruits of a labor which gives promise of large results. J. N. H.

EPILEPSY: ITS PATHOLOGY AND TREATMENT. An Essay to which was awarded a prize of four thousand francs by the Académie Royale de Médecine de Belgique, December 31, 1889. By HOBART AMORY HARE, M.D. (Univ. Penna.), B.Sc., Clinical Professor of the Diseases of Children and Demonstrator of Therapeutics in the University of Pennsylvania; Physician to St. Agnes Hospital and to the Children's Dispensary of the Children's Hospital; Laureate of the Royal Academy of Medicine in Belgium, of the Medical Society of London; Member of the Association of American Physicians. Pp. 228. Philadelphia and London: F. A. Davis, 1890.

THIS entertaining essay is, we believe, one of nine by this bright and energetic young writer which have received substantial recognition within a short period. Dr. Hare is decidedly to be congratulated on his ability as a prize-taker. That he is an indefatigable worker goes without saying, and he is winning not only monetary prizes, but an enviable name in his special field of work.

The subject is treated systematically in its various aspects—historical, symptomatic, etiological, pathological, and therapeutical. Dr. Hare takes issue with the belief of Gowers that transient post-convulsive paralysis may in certain cases be due to inhibition of the motor centres. Indeed, he is inclined to deal rather severely with this eminent neurologist for maintaining a view which he regards as altogether unnecessary, and entirely without physiological or other foundation. Yet we think that he is wrong; for the transient palsy succeeding a very slight fit, and that following seizures in which a purely sensory discharge replaces motor spasm, are better explained by Gowers's theory, of inhibition, than by that of Todd and Robertson's, of exhaustion. There at least seems nothing unreasonable in the view advanced by Gowers to account for the paresis succeeding a seizure of the latter sort; indeed, it cannot well

what is known among his colleagues as *acne cornée* (*acne sébacée concrète*), and also in a cutaneous affection described by him as "vegetative follicular psorospermia," and lastly in Paget's disease of the nipple, a novel parasite. This he recognized as the ovoid unicellular psorosperm, minutely described by Leuckart, and arranged according to Balbini in five separate families under the class of sporozoæ, one family being limited in its habitat to fishes, the others, in different measure, finding their host in different members of the animal kingdom. These animal cysts, well illustrated in the plates added to the treatise before us, were accurately illustrated in Darier's previous contributions to this subject. Special attention was early attracted to the theme in this country, in consequence of the odd circumstance that Prof. J. C. White, of Boston, was present in Paris when Darier's patient was shown, affected with the "vegetative follicular psorospermia," and the American dermatologist at once recognized the disease as identical with that described by him earlier in the same year as a form of follicular keratosis. At a subsequent date, but yet soon after his return home, the same gentleman had the singular opportunity of reporting the case of another patient with the same disease, in which a careful structural examination was made with a view particularly to the recognition of the parasites figured by the French author. The result was qualified.

The bodies claimed by the French authors cited, also by Mr. J. Hutchinson, Jr., of London, as the effective agents in the production of the diseases named, are recognized without great difficulty. Their morphological characters are distinct. They are ovoid or circular "corpuscles," very clearly defined, having a lucent and somewhat thickened enveloping membrane, wholly unprovided with fibrillæ of attachment to the peripheral elements. In volume they are two and even three times larger than the cells of the epithelium in which they are found lodged, and between which (never within which) they lie. They have a flattened "nucleus" usually pushed to one side of the enclosed mass of protoplasm, and, after the addition of alcohol, exhibit a decided retraction of this protoplasm with the consequent formation of vacuoles between the latter and the enveloping capsule. In the maturer condition the enclosed mass is found to contain numerous granules, which being released on rupture of the capsular wall, escape and are supposed to reproduce the psorosperms after introduction through an abraded stratum corneum into previously healthy tissue. The cysts are so large as to measure at times one-half or one-third of the entire thickness of the rete mucosum in which they are seen.

Cutaneous psorospermia is thus thought to be a special pathological condition, solely due to the invasion of the integument by the animal parasites described, and existing not merely in Paget's disease of the nipple and breast, and the similar epitheliomatous lesions which have been recognized in the scrotum, but also in certain forms of *acne*, *molluscum sebaceum* ("contagiosum," of Bateman), vegetating follicular psorospermia, in White's follicular keratosis, and also probably in other diseases and more particularly in other forms of cancer.

Upon this advanced position, it is proper to state that the scientific world looks to-day with simply respectful consideration. The conscientious work done by the investigators named is worthy of all praise and of future study. But it is yet to be distinctly settled that an epithelial cell may not under special conditions undergo peculiar metamorphoses

period between the reception of the injury and the first fit the man has contracted syphilis, which has produced epilepsy under the cloak of traumatism, and which is only relieved by mercury and the iodides, or he has a constitutional inherited tendency to epilepsy, aside from any extraneous causes." The convulsions might still have continued in the second case, after the removal of the depressed fragment of bone, and yet the epilepsy have been originated by the traumatism; the same might hold good had the fits had a luetic cause and careful anti-syphilitic treatment had been instituted. As Hughlings-Jackson expressed it, a syphilitic lesion may *cause the cause* of the fits, and this latter cause (probably high instability of cells in the vicinity of the original lesion), not being specific, may continue after the removal of all cerebral evidences of syphilis.

Through an oversight, perhaps, the dose of dilute hydrobromic acid, mentioned in the chapter devoted to the treatment of epilepsy, is considerably larger than that usually prescribed: one-half a fluidounce to one fluidounce, in place of one-half to one drachm. Nickel bromide, too, should scarcely be given in the same dose as potassium bromide. From five to ten grains is the ordinary dose of this salt of nickel, while that of potassium bromide is, of course, much larger.

In concluding these few criticisms we would say that the book is an excellent *résumé*, treated in a painstaking and thorough manner. We cordially recommend it to those interested in the subject.

D. D. S.

HYGIENE AND PUBLIC HEALTH. By LOUIS C. PARKES, M.D., D.P.H. Lond. Univ., Assistant Professor of Hygiene and Public Health at University College, London. With Illustrations. Pp. 485. Philadelphia: P. Blakiston, Son & Co., 1890.

THE second edition of this practical, plainly-written, elementary work on hygiene follows closely upon the first issue. The author must be congratulated upon the success of his efforts to interest the practising profession upon so important and vital a subject. It is remarkable to note how rapidly the question of hygiene is absorbing the attention both of the medical profession and the laity, and although there has not elapsed a sufficient time to allow of very important additions to the mass of sanitary knowledge already presented to his readers, Dr. Parkes is able to supplement the information already given with fresh facts and new tables.

It will be advisable to devote some space to the quotation of the new data and paragraphs, and thus enable the reader to judge for himself, viz.:

"There is also some evidence to show that leaden water-pipes are much more rapidly corroded when the mains are intermittently charged than when kept under constant high pressure."

In speaking of magnetic carbide of iron as a filtering substance, the following paragraph has been added: "A very similar material called polarite has lately come into use. It contains about fifty per cent. of magnetic oxide and carbide of iron combined with other insoluble mineral matters, and is capable of producing equally good results."

be explained otherwise. Gowers states (*Diseases of the Nervous System*, Amer. ed., p. 1089) that "just as such a discharge in the sensory centre may . . . set up secondary discharge in the motor centre, so it may, when slight, merely inhibit the centre." As regards foundation for Dr. Gowers's hypothesis, we think the theory fits in sufficiently well with the facts to render it acceptable. Too little is accurately known of the true nature of inhibition to permit one to attempt to dogmatize on the subject. We personally are inclined to the view of Brunton, that inhibition is not dependent upon the existence of special centres. He regards inhibition and stimulation as relative conditions depending both on the length of path along which the nerve-impulse travels, and its rate of transmission. His hypothesis, which is consistent with known facts, is that nervous stimuli, like those of light and sound, consist of vibrations, and that interference of waves, as in the case of light and sound, inhibit action, while coincidence of waves reinforces stimulation. Gowers's idea of the origin of some forms of post-epileptic paralysis is easily explicable by a consideration of Brunton's hypothesis.

We find nothing in the character of the syphilitic headache accompanying luetic epilepsy, described by Dr. Hare, which may not also be present in the cephalalgia attending lead-convulsions, although he is inclined to the belief that the symptoms are more or less peculiar to cerebral syphilis. Tanquerel described a quite identical headache preceding the outbreak of lead-epilepsy, and the reviewer has notes of cases presenting similar phenomena. This point is noted because cases of lead-convulsions occurring in this city, and presumably elsewhere, have more than once been mistaken for both specific and ordinary epilepsy. The reviewer must take exception also to the statement first made by Dowse, and now insisted upon by Hare, that "epileptic attacks beginning after thirty years of age are almost surely syphilitic, particularly if no history of traumatism or heredity is present." Fortunately, lead-convulsions are not of very frequent occurrence, so mistakes are not often apt to arise; yet, perhaps, because of their rarity, and certainly because of their obscurity (often as regards origin and prodromata) it is well to be mindful that they may occur at any age, and in those whose occupation does not expose them to the metal.

Discussing the influence of traumatism on the etiology of epilepsy, Dr. Hare urges that the greatest care be exercised in our decision as to the causative factor, so that we be not misled by a mere history of an injury into a *post hoc ergo propter hoc* opinion. He recognizes that cerebral injury may induce epilepsy, and yet, it seems to us, fails to lay sufficient stress on the well-known fact that even though the primary causative factor of epilepsy be removed, whether it be in a peripheral part, or central consisting of a depressed fragment of bone, the convulsions may still continue through a state of chronic high instability of certain cells having been set up by the irritant which does not disappear with the removal of the latter. This condition of affairs may be present even though no inherited tendency to cerebral disorder exists. Bearing on this, Dr. Hare states (p. 95): "Naturally, if two cases have a history of cerebral injury, and both are epileptic, one is apt to think that the same cause is at work in both instances, but in reality no proof exists that such is the case. In one individual, elevation of a depressed fragment of bone may result in a cure; in the other, even though a depression exists, and is removed, no benefit may be reached, because in the

MINERAL SPRINGS AND HEALTH RESORTS OF CALIFORNIA, WITH A COMPLETE CHEMICAL ANALYSIS OF EVERY IMPORTANT MINERAL WATER IN THE WORLD. Illustrated by WINSLOW ANDERSON, M.D., Joint Editor and Publisher of the Pacific Medical Journal, etc. Pp. 384. San Francisco: The Bancroft Company, 1890.

THE groundwork of this contribution to our knowledge of balneotherapy and the scientific internal administration of mineral waters was presented to the Medical Society of the State of California, April 20, 1889, and awarded the annual prize of the Society.

The work contains the names of over two hundred California Springs, with about one hundred analyses, and two hundred analyses of all the famous springs in America and abroad. Many of the analyses are by the author and show careful, painstaking work, extending over many years; the result is alphabetically arranged, which greatly aids in the convenience of reference. The surrounding locality of each spring is carefully described; the route of travel and the accommodations that an invalid may expect to find at the end of his journey for health are also considered;—and what can be more essential for the invalid's well-being than pleasant and attractive surroundings?

The vast expanse of territory known as the States of the Pacific Coast is remarkable for the number of its mineral springs, more particularly the hot and warm springs. Of these States, California stands at the head of the list; indeed, it is probable that this State has more known springs than any other State in the Union, east or west; but, on account of the enormous size of the State, and the fact that many localities are as yet almost unsettled, it is impossible in many instances to obtain complete reports.

The springs may be classified as sulphuretted, carbonated, alkaline, saline, chalybeate, and acid. As one would suppose, a large number of the springs are thermal, as over a large area of the State a volcanic rock-formation exists, with which these springs are usually associated. It must be borne in mind that the springs of Southern California are situated in a country whose climate has few equals in the world, and is surpassed by none, so that here the health-seeker may spend day after day, from sunrise to sunset, in the open air and derive all the benefits from such an existence totally independent of any medicinal constituents that the waters may contain. In the selection of localities to which physicians may recommend their patients, sufficient importance has not in the past been attached to the environment, and too much weight has been given to the particular number of grains per gallon in the water to be used.

W. A. E.

Sewage: "Another deodorizing method recently introduced is that known as the 'Amines' process. The sewage is treated with milk of lime and with a small quantity of herring-brine, which contains a certain percentage of the compound ammonia termed methylamine. This substance acts as a deodorant and antiseptic, and is said to sterilize the effluent completely, so that it undergoes no secondary fermentation, whilst the sludge is so far deodorized that it can be dried in pits exposed to the air, or of a drying kiln, without giving rise to noxious effluvia."

Air and Ventilation: "A new explosive termed roburite has been lately introduced into some Lancashire collieries. It is a mixture of nitro-benzines and ammonium nitrate. Several cases of poisoning, however, have occurred amongst the miners, both from handling the cartridges and from breathing the fumes after explosion."

Soils: "Another common cause of damp walls is defective gutters to the roof, or broken or otherwise damaged rain-water pipes."

Mineral waters are referred to with a few words of warning. A case is given of a water described as the purest water in the world. It was found to contain an excess of organic matter and floating particles, which on microscopical examination were discovered to consist of masses of fungi and bacteria, besides being impregnated with sulphuretted hydrogen.

Contagia: "Quite recently mice have been rendered immune against anthrax virus by injection of an albumose isolated from cultures of the anthrax bacilli."

A mere reference is made to chemical vaccination.

A table of weights and measures is also added.

It will be seen from the above quotations that, while no new discoveries of the first importance are to be found in this second edition, nevertheless Dr. Parkes is able to present his readers with some new and interesting facts, and thus keep them *au courant* with the history of this great subject, which can hardly yet be said to have emerged from its infancy.

S. G. D.

THE ESSENTIALS OF MEDICAL CHEMISTRY AND URINALYSIS. By SAM E. WOODY, A.M., M.D., etc. Third edition. Philadelphia: P. Blakiston, Son & Co., 1890.

THE fact that Prof. Woody's little book has reached a third edition in such a short time is sufficient proof of its usefulness for, and demand by, the medical student. The selection of the material and its plan of presentation resulting from the author's large experience as a practitioner and teacher of medical chemistry is well intended to offer to the student that which is really essential for his limited college course, and it is to be hoped, a basis for further instruction in this important branch of medical science.

While we might hint at the superfluous elucidation of strictly-technical processes, and the reappearance of the publishers' much-used cuts from all their other chemical works, such as refining sulphur, making reduced iron, etc., we can but congratulate the author on his additions in organic chemistry and urinalysis, and bespeak for his little work the attention of medical students and practitioners.

L. W.

shows, has given only moderately satisfactory results; while it possesses many advantages, yet the inconvenience of requiring large doses, which are apt to prove irritating to the stomach and intestine, detracts from its value. Chloroform, on the contrary, in the author's opinion, possesses so many advantages that it is surprising that it is not more frequently employed. He claims that it has no action on the delivery or on the production of post-partum hæmorrhages, or on any of the conditions of the puerperal state. He maintains that it is indicated in all cases where suffering is excessive, where the contractions of the uterus are spasmodic, or where there is a spasmodic contraction of the cervix, where there is placental retention from uterine contraction, or where there is a rigid perineum. The only contra-indication to the use of chloroform is chloro-anæmia, with a tendency to syncope. He even maintains that acute or chronic pulmonary affections, diseases of the heart, kidneys, or of the nervous system need not interfere with the cautious administration of this anæsthetic.

Cocaine has been but little employed in such conditions. It may, however, serve to render great service in diminishing the pains which attend the passage of the head through the vagino-vulvar canal. The best results can be obtained with a five-per-cent. solution, which may be administered upon cotton tampons, allowed to remain for a few minutes, and then replaced by others. Such a procedure is even stated to accelerate labor, as, the suffering being less, the voluntary assistance rendered by the patient contributes toward hastening the termination; or, a four-per-cent. ointment may be employed, also with apparently equally satisfactory results. It should be noted, however, that sublimate injections should not be employed simultaneously, as through their action the alkaloid is decomposed and its properties are thus lost. Finally, reference is made to subcutaneous injections eight or ten minutes before the expulsion of the head. These injections may be made directly under the labia, and prevent the violent pains which generally attend the passage of the head.—*Therapeutic Gazette*, No. 11, 1890.

EXPERIMENTS UPON THE ACTION OF CHLOROFORM AND ETHER.

The conclusions of PROFESSOR MACWILLIAM, of Aberdeen, in his report to the committee of the British Medical Association, are the result of a long and elaborate investigation in which a novel method of studying the heart and vascular system was used. From his work it seems that during chloroform anæsthesia the blood-pressure is lowered and the heart's action is weakened. Thus chloroform exerts a direct influence on the heart—depressing its energy, diminishing its tone, and dilating its chambers. Such dilatation of the heart occurs to an appreciable extent even when chloroform is administered gently, mixed with abundance of air, less than four per cent., and may occur even before the conjunctival reflex is abolished. The dilatation affects all parts of the heart, more or less, and is not due to the accompanying fall of pressure from action on the vasomotor centres, or to the diminished blood-supply through the coronary arteries. Under chloroform, dilatation often occurs very quickly, before there is any fall of pressure.

There is no distinct change in the rate of the heart's action when dilatation occurs. A sudden and complete cessation of the cardiac rhythm is never

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF
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AN ADDITION TO THE THERAPEUTICS OF EPILEPSY.

Almost countless drugs and combinations of drugs have been used in the treatment of epilepsy, with the result that the various bromides, either singly or combined, have so far given the best results in relieving this distressing disease. DR. CHARLES S. POTTS has sought some drug which would be equally efficacious in lessening the number of epileptic seizures and at the same time not cause the disagreeable symptoms which may follow the persistent use of the bromides. With this end in view various drugs, as antipyrine, antifebrin, and bromide of ammonium were separately tried, but with indifferent results until Dr. H. C. Wood suggested the use of antipyrine and bromide of ammonium in combination. Since then this mixture has been used with excellent results in the treatment of forty-three cases of idiopathic epilepsy. In none did it fail to cause marked amelioration of the symptoms, and in some it gave relief when all the other commonly-used remedies had failed, and in none has there been any indication of bromism, or of the disagreeable symptoms to which antipyrine sometimes gives rise.

For adults the dose, which is given three times a day, contains six grains of antipyrine and twenty grains of bromide of ammonium.—*University Medical Magazine*, No. 1, vol. iii., 1890.

ANÆSTHETICS IN NATURAL LABOR.

DR. CHAIGNEAU has recently made a comparative study of the different anæsthetics which are employed in parturition. Although these agents are very numerous, attention need only be directed toward chloroform, chloral, antipyrine, and cocaine, as they are about the only ones given which it is warrantable to employ under these circumstances. Antipyrine, the author

cally carried on, day by day, by means of suitable apparatus, and with the care necessary to prevent injurious results or accidental poisoning. It is not necessary to induce anæsthetic action, but the inhalation can be kept up continuously for several hours daily, and maintained short of general anæsthesia.—*New York Medical Record*, November 1, 1890.

TREATMENT OF DYSENTERY.

DR. H. A. FAIRBAIRN calls attention again to the advantages of irrigation of the large intestine and the thorough flushing of its contents. In the early stages the walls of the intestine are not liable to be weakened by deep ulcerations. The amount of fluid which may be safely used is three or four pints, since the capacity of the large intestine, as a rule, is about six pints. The temperature of the water, which should have been boiled or distilled, should be about 100° or 105° F., except, possibly, in the first or second administration, when quite a low temperature appears of benefit. The patients are confined to bed, are deprived as much as possible of food, except whiskey well diluted. Peptonized milk in very small quantities, not more than a quart in twenty-four hours. If the patient will take no food for forty-eight hours it is a great advantage.

The liquid preparations of beef, with their concentrated salts, are apt to be irritating. Eggs, scraped beef, or, when these are objected to, steak, roast and chop, with bread, make up the dietary.

A cathartic may be administered at the beginning of the case. If there be nausea, calomel in small and frequently-repeated doses is the drug chosen, otherwise sulphate of magnesium. Salol is then ordered, and opium in some form if the pain demands. Naphthalin and corrosive sublimate may also be employed.—*Brooklyn Medical Journal*, No. 10, 1890.

EPSOM SALTS IN THE TREATMENT OF ACUTE DYSENTERY.

Powdered ipecac is the remedy which is most frequently used in the treatment of acute dysentery, and in India large doses of it are considered the best method of attacking the disease.

There are, however, objections to be raised against the administration of large doses of ipecac in this disease. Its influence is depressing, and this action is promoted by the nausea and vomiting, and, further, the vomiting may become uncontrollable.

The disease is one which is accompanied by much nervous depression, which it is important not to increase.

After observing a number of cases in which there were marked depressing effects from ipecacuanha, DR. A. W. LEAHY began treating cases of acute dysentery with a saturated solution of sulphate of magnesium, following a recommendation of Bartholow's, who regards the administration of sulphate of magnesium as the most efficient treatment of this disease, particularly in the acute stage.

Dr. Leahy gives a table of nearly one hundred cases treated at Hyderabad among the poorer class of patients, the vitality of many of whom was at an exceedingly low ebb when they came under treatment. Out of ninety-five,

caused by the inhalation of chloroform. Cardiac failure occurs by a more or less sudden enfeeblement and dilatation of the organ, not by a sudden, complete cessation of rhythm.

Cardiac failure sometimes occurs in this way a considerable time before the respiration stops, though generally the respiration stops before the heart has become incapacitated, and the failure of artificial respiration to bring about recovery, in some cases of chloroform collapse, is in all probability due mainly to the enfeebled and distended state of the heart, which has become unable to maintain the circulation.

The contrast between the relation to the heart's action of chloroform and ether in anæsthetic doses is very marked. With ether, the induction of anæsthesia with complete abolition of the conjunctival reflex has not been attended by any noteworthy dilatation; indeed, effects of a stimulating character have sometimes been observed.

Changes in the respiration exert a most important influence upon the effects of chloroform administration. An amount of chloroform which can be given with safety during easy breathing may speedily become dangerous during deep, rapid respiration; further free dilution of chloroform with air, the restriction of the percentage of chloroform vapor to four or four and one-half per cent. gives no security against an overdose. A percentage that gives safe anæsthesia during ordinary breathing may lead to fatal collapse if given during exaggerated respiration.

It is suggested that in case of fall in blood-pressure that this condition may be somewhat counteracted, in the upper portions of the body, by pressure upon the abdomen over the aorta.—*British Medical Journal*, No. 1556, 1890.

TREATMENT OF INGROWN NAIL.

DR. PÜRCKHAUER moistens the surface of the diseased nail with a lukewarm forty-per-cent. solution of caustic potash, and then scrapes off the softened upper layers with a sharp-edged piece of glass. After a second application of the potash solution the scraping is continued until the nail is as thin as a sheet of paper. It is then lifted up from the soft parts with forceps, and the diseased parts are excised.—*Therapeutic Gazette*, No. 11, 1890.

PREPARATION OF SACCHARIN.

R.—Saccharin	. . . . .	150 grains.
Bicarbonate of soda	. . . . .	75 "
Distilled water	. . . . .	Oij

One part of this solution is equivalent to two and one-half times as much sugar.—*Nouveaux Remèdes*, No. 19, 1890.

CHLOROFORM AND PHTHISIS.

DR. SAMUEL O. POTTER reports that he has discovered a cure for tuberculosis in the almost continuous inhalation of chloroform. As a result of some experiments he feels convinced that this bacillus may be destroyed, and its victims saved, by the continuous use of chloroform inhalation, systemati-

a strict meat diet; in the latter sugar was found in great quantity in the urine after sulphonal had been suspended.

In the same cases antipyrine was tried before sulphonal, but the effect produced by antipyrine was less marked than that by sulphonal.—*Medicinische-Chirurgische Rundschau*, Heft 20, 1890.

MEDICINE.

UNDER THE CHARGE OF

J. P. CROZER GRIFFITH, M.D.,

PHYSICIAN TO ST. AGNES AND THE HOWARD HOSPITALS, AND ASSISTANT PHYSICIAN TO THE
HOSPITAL OF THE UNIVERSITY OF PENNSYLVANIA.

THE SECRETION OF HYDROCHLORIC ACID IN THE STOMACH DURING DIGESTION.

V. JAKSCH (*Zeitschr. f. klin. Med.*, B. 17, H. 5, 383) has devoted his attention to the determination of the exact amount of hydrochloric acid present during different periods of digestion. He describes the method of analysis which he employs, and which consists in a modification of that of Sjogvist's. This is a gravimetric method, in which the hydrochloric acid is caused to unite with barium, and the barium then recovered in the form of the sulphate and weighed.

A series of experiments were performed on each of a number of children who presented no disturbances of digestion. A definite amount of nourishment was administered in the morning on an empty stomach, and the contents of the stomach later removed by the method of expression after the lapse of intervals of time varying one-quarter of an hour in the different experiments. The amount of hydrochloric acid present in 10 c. c. of the unfiltered gastric contents was in each instance determined; the author having found that the filtered contents lost considerably in the amount of acid. He details his observations proving this loss.

Series of observations were made by administering respectively boiled ham, boiled milk, and purely hydrocarbonaceous food. All the experiments are reported in full.

The principal results of these studies are the following:

1. Within one-quarter of an hour after the administration of nourishment the stomach has produced an appreciable quantity of hydrochloric acid, and this amount increases until it reaches its maximum from one to three hours after food is taken.

2. The secretion of the acid does not constantly increase, but may, after one and a quarter to two hours, show intermissions.

3. The amount secreted increases most rapidly after the ingestion of flesh; more slowly after milk. This is doubtless due to the property milk has of forming compounds with hydrochloric acid; and this fact also explains the

three died; two out of these three cases were stated to have been in a moribund condition at the time of their admission to the hospital. It appears that, on an average, two day's treatment with Epsom salts is required to produce disappearance of dysenteric symptoms. The treatment subsequent to the production of this condition consists of an astringent mixture, with opium. The method of administration is to take a sufficient quantity of sulphate of magnesium to saturate seven fluidounces of water, and to this saturated solution add one ounce of diluted sulphuric acid. The dose of this is a tablespoonful every hour or two in a wineglassful of water until it operates. Sulphate of morphine may be combined with it, or starch enemata with laudanum may be employed.

Dr. Leahy claims that in the earlier stages of dysentery this saturated solution of Epsom salts acts like a charm; fever, if present, disappears; mucus and blood are wanting in the stools, which become copious, feculent, and bilious; the tenesmus ceases; the patient's anxiety diminishes; the skin acts well, and sleep follows the administration of the first few doses. It is especially in acute cases that sulphate of magnesium is so valuable; the more chronic the case becomes, the less apparent are the advantages of this method of treatment. Dr. Leahy has ordinarily given a drachm of this saturated solution with ten drops of dilute sulphuric acid every hour or two until its effects became evidenced in the feculent character of the stools and their freedom from blood and mucus, or until the temperature has fallen, and the pain and tenesmus have ceased. When the stools have become normal in color and appearance, and the patient only passes two or three in the twenty-four hours, an ordinary astringent mixture of acid with laudanum or tincture of Indian hemp, or a pill containing extract of opium, is usually all that is necessary to complete the cure. It is, of course, imperative to diet the patient with great care.

This treatment Dr. Leahy compares with that by ipecacuanha as follows: It has no depressing action on the system, it neither produces nausea nor vomiting; it quiets and soothes the patient.

In twenty-seven cases of acute dysentery among Europeans all were successfully cured.

It is peculiarly in acute dysentery that the saturated solution of sulphate of magnesium will yield such excellent results. The more chronic the case the less likely is the remedy to prove of value.—*Lancet*, No. 3501, 1890.

SULPHONAL IN DIABETES.

DR. V. CASARELLI has used sulphonal in diabetes with the following results:

Sulphonal exerts a favorable influence upon the chief symptoms of diabetes, diminishing the quantity of sugar, also the polyuria and polydipsia.

These results are obtained in a moderate degree by a dose of 15 to 30 grains *pro die*. They are more marked with a dose of 45 grains, which may be given for several days; 30 grains is well borne for a longer time, 45 grains creates no disturbance at first, but if persisted in for a time produces dizziness and excessive somnolence, which disappear upon the reduction of the dose.

The favorable effects of sulphonal are as evident with a mixed diet as with

it produces no symptoms whatever, or because it is too small or too centrally situated to be recognized with any certainty.

The clinical diagnosis of an abscess of the liver depends principally on three factors: 1. Objective symptoms. 2. Subjective symptoms. 3. The etiology.

Of the *objective symptoms*, the enlargement of the liver is a sign never absent in cases capable of being diagnosticated. Yet this enlargement has three characteristic peculiarities which, together, are of almost pathognomonic significance: (a) The liver is enlarged chiefly in an upward direction, so that the right lobe pushes the diaphragm upward into the right thoracic cavity. Enlargement of the liver downward and to the left, though usually present also, has but little diagnostic significance. (b) The second peculiarity, the more or less, though usually slight, convex form of the upper line of liver-dulness, is a very valuable sign of liver abscess. This convexity may occur at any part of the perimeter of this boundary. (c) A third characteristic of the enlargement is that the hepatic-pulmonary percussion boundary which has been displaced upward, and which should in normal conditions be movable through respiration or by lying on the side, is now very little or not at all so. This sign should be looked for very carefully in order to distinguish abscess from a hyperplastic or pseudo-leukæmic liver. This lack of motion is due partly to the formation of adhesions, partly to the fact that the right half of the diaphragm moves less on account of pain, and partly to the resistance which the suspensory ligaments offer to the depression of the organ.

Frequently, with the high position of the diaphragm, there are also present the symptoms of compression or relaxation of the lungs, and care must be taken not to suppose a liver abscess to be a pleural effusion.

Several other objective symptoms may be noticed on inspection. A not inconsiderable distention of the right hypochondrium and the hepatic region, with diminished motion on respiration and widened intercostal spaces, occurring in a man of cachectic appearance and of middle age arouses the suspicion that there exists a collection of pus in the liver. When collateral œdema or a fluctuating tumor is also to be felt in the intercostal spaces or in the epigastrium, no one can fail of a diagnosis.

Further objective symptoms are the suffering, apathetic appearance of the patient, who is evidently very ill; the dull eye, weak pulse, anæmic murmurs, hectic fever. The feet are not infrequently œdematous.

Very considerable dyspnoea increasing on exercise, cough with or without expectoration, and pain and a sense of tension in the side are rarely absent. If in addition to these there is a phthisical habitus and history, and particularly if there is also some slight alteration in one apex, one may be led to make the mistaken diagnosis of tuberculosis. The author has seen the bloody expectoration, occurring after the rupture of a liver abscess into the lungs, mistaken for the hæmoptysis of pulmonary disease.

Icterus was observed in none of the author's cases.

Of the *subjective symptoms*, the pain already referred to may be mentioned as the most constant. It occurs in the hepatic region or in the back, or sometimes in the breast or gastric region, and it often radiates toward the posterior aspect of the right shoulder. It is increased by pressure, and in the latter stages of the disease is very severe.

small amount of free acid found in the stomach of nursing children. The amount of acid increases most slowly after the ingestion of hydrocarbons, though its increase during the first quarter of an hour is most rapid after this form of food.

4. The highest average amount of acid in the gastric excretion was found after a milk diet, and equalled 0.1615 gramme in 100 c.c. gastric contents. After a flesh diet the average amount equalled 0.1563, and after hydrocarbons 0.1102.

5. Digestion appeared to be more rapidly completed after the ingestion of small amounts of flesh; next rapidly after hydrocarbons, and least so after milk.

The author points out how these results may be of value as regards both the physiology and pathology of digestion. From the last point of view he considers that the absence of free acid after one to three hours after flesh or milk has been eaten renders it very probable that there exists some severe disturbance of the gastric function; while no such conclusion can be positively drawn after a diet of carbohydrates. Further, that large amounts of free hydrochloric acid found as long as two to three hours after eating flesh or milk do not indicate a hypersecretion. A milk diet is not to be recommended in the pursuit of studies upon digestion.

In a second part of the author's article he has endeavored to determine the relative sensitiveness of some of the different color-tests for free acid in the gastric secretion. It appears that Congo paper and benzopurpurin have about the same value, but that the Günzburg reaction is by far the most delicate of all the color-tests. All of them are, however, inexact, and not reliable for scientific purposes.

Still a third series of experiments was carried out to determine the amount of hydrochloric acid secreted by sick children under different conditions.

The most important results were:

1. That the quantity of acid found one hour after the ingestion of nitrogenous food depends upon the age and weight of the child.
2. That great variations are witnessed under pathological conditions, but that catarrhal conditions of the stomach, dyspepsia, etc., lead to a diminution in the acid secretion.

The author also tested the value of the administration of weak tea and saccharin as an excitant to gastric secretion, but found that, although hydrochloric acid could usually be detected after three-quarters of an hour, yet it was sometimes entirely absent, and was always much less than after the ingestion of nourishing substances.

THE DIAGNOSIS OF ABSCESS OF THE LIVER.

PEL (*Berlin. klin. Wochenschr.*, 1890, 34, 765) read a paper on this subject before the International Medical Congress, in which he gives the result of his observations on twenty-five cases of solitary liver abscess, of size sufficient to admit of a diagnosis being made during life. Only one of these occurred in a woman.

In many cases an abscess of the liver cannot be detected, either because

The second patient suffered five years, before treatment, from abscesses caused by caries of the femur. Under surgical treatment these entirely healed. At the time of the Koch treatment there was a large ulcerating area involving the left cheek and the lower eyelid. Two injections were administered, the first containing 0.005 grm. of the remedy; the second, seven days later, 0.008 grm. Local and general reaction were marked. Eight days after the last injection complete healing had taken place.

RYDYGIER, for the purpose of proving the diagnostic value of the Koch material, used it upon a case of rhinoscleroma without exciting any reaction, although the dose was pushed to 0.14 grm.

In another patient who suffered for seven years from epithelioma of the point of the nose there was a superficial ulceration of the right breast of about six weeks standing. This presented the characteristics of lupus. After the first injection of 0.01 grm. there was not the slightest reaction about the nose, but the lupus-patch was decidedly affected.

In nearly all cases of tuberculosis the spleen was markedly enlarged during the reaction period, and in many instances traces of albumin were observed in the urine.

In one case of lupus, although the lungs were perfectly sound, after the first injection of 0.01 grm. the temperature rose to 105° F., but without other symptoms which could give rise to anxiety. Eight days later the second injection of the same strength was given. Collapse lasting for several hours followed, which yielded slowly to repeated doses of cognac, wine, strong coffee, and hypodermic injections of camphor oil. This case is in striking contrast to the majority treated, since the reaction, after the second dose of the same strength as the first, was far more violent than after the first administration of the remedy.

In one case, aged eight years, with sound lungs, but exhibiting scars and ulcers on the left forearm, together with fistulæ extending to the metacarpal bones, 0.006 grm. of the remedy was followed by violent local reaction and collapse which yielded only to most careful treatment, the pulse beating at the rate of 200 per minute. In both these cases it was observed that during collapse there was marked cyanosis of the lips, nose, and fingers.

Rydygier treated many cases of lupus and of bone and joint tuberculosis, two cases of lymphangitis, and several medical cases, by Koch's injection. A child, suffering from caries of the tarsal bones, was operated upon for removal of the diseased tissues. The three cuneiform bones were excised, and the sharp spoon was used many times. In spite of this, and although treatment by means of iodoform and glycerin and Peru balsam had been carefully employed, a fistula persisted. After the first injection of 0.003 grm. of the Koch remedy the fistula closed. Three more injections were given, the strongest containing 0.007 grm. At the time of the report there was free motion in the foot, no pain on pressure, and the patient seemed entirely cured.

In three lupus-cases, and one case of tuberculous ulcer of the skin, the crusts deposited upon the ulcerating area after injection were carefully examined. In only one instance were many tubercle bacilli found.

ANGIER (*Mün. med. Woch.*, No. 49, 1890) treated a girl, aged fourteen years, who had been suffering over four months from an ulcer of the nose involving

Finally, the *etiology* is to be considered. The fact that the patient has suffered from tropical dysentery, or even that he has lived in warm climates, may give occasion to the development of an hepatic abscess. Of the cases occurring in temperate regions there may be various etiological factors, such as gall-stone, inflammation in the region of the portal vein, suppuration of echinococcus cysts, metastatic suppuration of the liver, and trauma. But in eight of the author's cases no cause at all could be found.

As regards differential diagnosis, the affection is most frequently confounded with tuberculosis. It must also be distinguished from malaria, pseudo-leukæmic infiltration of the liver, biliary colic with subsequent intermittent fever, syphilis of the liver with or without the formation of gummata, soft neoplasms, deeply situated phlegmonous inflammation of the abdominal walls, encysted pleural effusions, and sub-diaphragmatic collections of pus.

It is especially difficult to determine whether a collection of pus is in the convex portion of the liver or between the liver and the diaphragm, or is an encysted empyema. It is to be noted, in this connection—1, that sub-phrenic abscess almost always gives physical evidences of containing air; 2, that in the case of circumscribed empyema on the anterior surface of the thoracic cavity the heart is almost always dislocated toward the left, and the dulness of the two is continuous.

SURGERY.

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SURGICAL TUBERCULOSIS TREATED BY KOCH'S METHOD.

The statement has been frequently made that, in spite of the fact that cases have been treated by Koch's method for many weeks, there are as yet no instances of complete cure. BAUM (*Deut. med. Zeit.*, No. 103, 1890) records two cases which he considers to have been definitely and permanently cured by injection. The first, aged twenty-two years, suffered eighteen years from lupus of the right hand and of the fingers. The disease was extensive and accompanied by much scarring. On the 25th of November 0.008 gm. was injected. The general reaction was very slight. There was, however, marked local reaction. Four days later 0.01 gm. of the remedy was given; this was followed by the characteristic reaction. On the 5th of December, 0.015 gm. was injected. On the 13th of December the whole ulcerating area was entirely healed.

EBSTEIN (*Deutsch. med. Woch.*; *Deutsch. med. Zeit.*, No. 1, 1891) states that the Koch injections are contra-indicated by the presence of tubercular ulcerations of the bowel, especially where there have been recent hæmorrhages, by the existence of constant pain and localized abdominal tenderness pointing to the presence of circumscribed peritonitis secondary to bowel ulceration, by colliquative diarrhœa especially when associated with hectic; and by the existence of tubercular peritonitis accompanied by fluid exudate. Ebstein reports an exceedingly interesting case of tuberculosis in the urethra. The patient was suffering from involvement of the apices of both lungs and from laryngitis of moderate severity. When examined, on his entrance into the hospital, a tight phimosis was found. After operation upon this there was discovered an induration beginning behind the glans penis and involving the corpus cavernosum. This indurated area was about two inches in length and almost an inch in breadth. The borders were irregular, but sharply circumscribed; there was no tenderness on handling, but behind this indurated area pressure gave pain. The urine contained albumin, red blood-corpuscles, and tubercle bacilli. By pressing upon the urethra behind the infiltration, pus containing tubercle bacilli was forced from the meatus. The inguinal glands were slightly enlarged. There was some tenderness on pressure in the region of the left kidney. The patient did not react till the fifth injection, when the dose of 0.01 c. c. was reached. No local reaction was observed, nor was there detected any distinct amelioration in the local lesion.

In a case of brain tumor, Ebstein practised an injection of 0.001 c. c. to determine whether or not this lesion was tubercular in nature. The patient experienced a decided rise in temperature, and had nine convulsions during the night following the treatment; these were apparently due to the action of the remedy upon the intracranial lesion.

In a patient, aged forty years, suffering from what was apparently syphilitic involvement of the sternum and left knee, injections of two, four, and six milligrammes, respectively, excited no fever, but decidedly increased the local pain. After subsidence of the latter there was a marked improvement in the mobility of the knee-joint. A chronic eczema of the leg became red and inflamed.

CZERNY (*Deutsch. med. Woch.*, 51, 1890) practised a hundred and forty-eight injections upon fifty-five patients in two weeks. There were twenty-two cases of joint disease, ten of whom had previously been operated upon. Glandular enlargements, periarticular fistulæ, peritonitis, lupus, periurethritis, and other forms of surgical tuberculosis were treated.

Czerny grants that the Koch material exerts a specific action upon tuberculous processes. There are however, non-tubercular individuals who react to 0.01 c. c. of the material, and again, certain tuberculous patients do not react. While it is true that, as a general rule, the reaction becomes less violent when the injections are repeated, there are exceptions to this. There may be a violent reaction without fever, or the general reaction may be exceedingly well marked, while the local reaction is wanting. Violent general and local reaction in cases which bacteriological and physical examination has shown are apparently sound, would suggest the possibility of a dissemination of the tubercle bacilli. In the initial forms of tuberculosis, and in lupus, the

the septum; the latter was almost completely destroyed. Since the injection of 0.005 grm. produced no reaction whatever, it was decided that this lesion was syphilitic. The diagnosis was abundantly confirmed by the use of mercury inunctions.

Another case, which had been operated on two years before for the cure of white swelling of the knee, returned to the clinic. Four injections were not followed by local reaction, from which the reporter concludes that the tuberculous areas were either entirely removed, or, if present, existed in a latent form.

Angier states that the fever lasted longer after the first injection than after those which followed. In one case this fever lasted forty-two hours with three exacerbations. When this patient was injected for the second time the fever lasted twenty hours.

Another instance in which the reaction was more violent after the second injection than after the first, was afforded in the person of a girl aged fourteen years, suffering from lupus of the nose and face. The first injection (0.004 c. c.) was given on October 21st. This was followed by local and general reaction of moderate intensity, with marked swelling of the cervical lymphatic glands. This injection was twice repeated in the same dose without exciting alarming symptoms. On the third repetition (December 1st) the general reaction was intense. The face and hands became cyanotic, and the patient suffered from dyspnoea. Shortly afterward there was a violent chill, the temperature ran up to 105.6° F., and the spleen became much enlarged; somnolence alternating with delirium followed. The local reaction was very slight. The general symptoms did not subside till the third day, when the patient again felt quite well, and the lupus-area and swollen glands were found to have undergone favorable changes.

LANNELONGUE (*Bulletin Méd.; Deut. med. Zeit.*, No. 104, Dec. 17, 1890) reports a case of lupus involving the nose, face, and left hand. The patient was eight years old, and suffered from no other tubercular lesions. Three injections were given, when, on the eighth day of treatment, the patient complained of pain in the knees. On examination there was found distinct diminution in the power to rotate the head, very great swelling of both elbows and both shoulders, especially the left; pain in the left thumbs; pain and tenderness in the head of the femur; limited motion in the ankle-joints, and an abundant effusion into both knee-joints.

This, according to Lannelongue, would point rather to diffusion of tubercular infection than to development of latent tuberculosis, since the symptoms described did not appear for eight days after the first injection.

BULIKOWSKI (*Przegląd lekars.*, 50, 1890; *Deut. med. Zeit.*) after observing the effect of the Koch injection, as practised in Kaposi's clinic, comes to the following conclusions:

1. The injection of Koch's material excites in lupus-areas an inflammation accompanied by the well-known general symptoms of reaction.
2. Reaction follows not only in pure tuberculous diseases, but also in others, as, for instance, lepra arabum, lupus erythematosus, and sarcoma.
3. It cannot yet be positively asserted that the injection of Koch's material is always followed by reaction, even though the disease is strictly tuberculous in nature.

had easily been relieved by the use of enemata. The obstruction and vomiting continued. There was almost no abdominal distention. The pulse and general condition were good.

Laparotomy was performed four days after the beginning of the attack. The small intestine was explored, and, with gentle traction, there was brought to view a portion which had been subjected to a circular constriction, as shown by the white ring around the bowel and the collapsed portion of the gut beyond. It was supposed that the obstruction had been relieved, and the abdomen was closed. The symptoms continued as before operation, and the patient died three days later. The autopsy showed that almost five feet of the small intestine were contained in the lesser cavity of the peritoneum, having entered through the foramen of Winslow. At the first operation only a portion of the gut had been withdrawn, and the obstruction consequently continued.

THE SURGICAL TREATMENT OF PERITYPHLITIS.

TAFFIER and HALLIM (*Archiv. Gén. de Méd.*, September, 1890, p. 257) present a paper upon this subject. They call attention to the fact that operation for perityphlitis is practised less in France than in other countries. As is the custom here, they apply the term perityphlitis to any inflammation in the neighborhood of the vermiform appendix or the cæcum, regardless of the primary cause of the inflammation. They consider disease of the vermiform appendix the cause of the great majority of inflammations in this region; perforation of the appendix is produced in most cases by a fecal concretion. They advise operation as soon as the formation of pus is suspected. They call attention to the fact that haste in operating is much less dangerous to the patient than delay. The incision for ligature of the internal iliac artery is the best. The vermiform appendix should always be excised if possible; the abscess cavity well drained and washed out. They mention a case in which the opening in the vermiform appendix—through which a concretion had escaped—was closed with Lembert sutures, and yet three months after the operation the wound reopened and a quantity of mucus was discharged.

The paper is concluded with a long list of cases—by various operators—in which operation had been performed for perityphlitis.

LAPAROTOMY FOR GUNSHOT WOUND.

DR. W. T. SCOTT (*Medical Record*, vol. xxxviii., No. 19, p. 516) reports a successful case of laparotomy for gunshot wound of the abdomen. The bullet was a 0.38 calibre conoidal ball. It entered the abdomen one and three-quarters inches above and to the right of the left anterior superior spinous process of the ilium.

Laparotomy was performed four hours after the receipt of the injury. A small quantity of the intestinal contents was found in the peritoneum. Four perforations of the ileum were discovered within a distance of four inches. The ball was not found, and no further injury was detected.

The intestinal wounds were closed with the Czerny-Lembert suture; the peritoneum was freely irrigated and drained with a glass tube. The patient

Koch material is so satisfactory in its results that it may fairly be considered the most brilliant discovery of therapeutics.

TUBERCULOSIS AND PSEUDO-TUBERCULOSIS.

ROGER (*Gazette Hebd. de Méd. et de Chirur.*, 37 An., No. 45) shows that in tuberculosis there is absolutely nothing which may be considered characteristic in the anatomical elements of the lesion, or in the arrangement of these elements. Animal parasites, inert foreign bodies, or the syphilitic lesion, may all be characterized by the central giant-cell with its surrounding zones. The pseudo-tuberculosis from foreign bodies, and that dependent upon verminous parasites, are readily distinguished by the absence of infectious properties. The pseudo-tubercular affections are practically not found in man; in the lower animals, in addition to the causes just named, may be mentioned non-bacterial mycoses (*aspergillus*), and bacterial zoöglæa and bacilli.

Roger, on the basis of a comparative study, doubts whether the appearance and staining reaction of the tubercle bacillus are sufficiently characteristic to separate it from all other bacteria. The bacillus of fowl-tuberculosis is, on accurate study, found to differ from the human bacillus in regard to its growth on culture media and its virulence when injected into various animals; yet the staining reactions are the same, and the general appearance is almost identical.

In view of the varying progress of tubercular disease in the human being, the rapid course and wide extension in some cases, the long-continued localization and ultimate cure in others, it seems probable that there may be in man several varieties of bacillus reacting in the same way to stains, but possessed of different pathogenic properties.

MICROÖRGANISMS OF SUPPURATION AS ACCESSORIES TO THE TUBERCLE BACILLUS IN LUPUS.

After careful bacteriological and clinical study, LELOIR (*Le Médecine Moderne*, 1re An., No. 49) finds that in many cases the ulcerations and nodosities characterizing a lupus-area and its environment are immediately excited, not by the tubercle bacilli, but by the microörganisms of suppuration. The lupus-lesion is essentially a dry tubercle. Ulceration does not usually occur except as the result of the action of suppuration microbes.

When the Koch bacilli and pyogenic microörganisms combine their action the elementary lupus-lesions become softened and exhibit a tendency to suppuration and ulceration. This fact is of major importance from a therapeutical standpoint, since anti-tubercular treatment will often aggravate symptoms which will promptly yield to anti-suppurative applications.

HERNIA THROUGH THE FORAMEN OF WINSLOW.

MICHEL GANGOLPHE (*Lyon Médicale*, t. lxiv. p. 607, 1890) reports a case of this rare condition. The patient, a man aged fifty-seven years, was seized, twenty-four hours before admission to the hospital, without any appreciable cause, with violent intestinal colic, vomiting, and inability to pass gas or feces. Four years before this he had had an exactly similar attack, which

of the thorough antiseptic cleansing of the affected bowel the gangrenous portion was enabled gradually to disintegrate and come away through the large tube without the formation of any gross interruption of continuity in the intestinal wall.

The author advises in the treatment of damaged bowel in strangulated hernia: Free division of the stricture; the return of the intestine just inside the abdomen with as little pressure as possible, after thorough antiseptic cleansing; the careful adjustment of a drainage-tube, having a diameter of not less than half an inch, in such a way that its inner extremity may lie almost in contact with the reduced bowel. He considers resection very rarely necessary; and the formation of a faecal fistula, as in the second case, very much to be preferred to the formation of an artificial anus at the time of operation.

OTOLOGY.

UNDER THE CHARGE OF

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POST-MORTEM EXAMINATION OF THE EAR IN A CASE OF ACQUIRED DEAF-DUMBNESS.

DRS. P. C. LARSEN and HOLGER MYGIND, of Copenhagen, have given an account of this very interesting case in a recent number of the *Archiv für Ohrenheilkunde* (vol. xxx., September, 1890). The patient, when two and a half years old, was attacked with some form of cerebral disease, for which no physician was called. In the course of eight weeks after recovery it was discovered by his family that he was deaf. Before the attack he undoubtedly heard well. From the notes given it would appear that the child had suffered from cerebro-spinal meningitis. When about twenty-one years old this young man died of phthisis, in the Royal Institution for the Deaf and Dumb, Copenhagen.

Both temporal bones were examined within two hours after death by the above-named observers. The right temporal bone was normal in shape and size. The aqueducts of the vestibule and cochlea were impervious a few millimetres from their external openings. The external auditory canal was normal, and closed at its inner end by a normal membrana tympani. The malleus was slightly retracted and not very movable from without. The tympanic cavity was normal in shape and size. The mucous lining was thin and pale, and not thrown into folds; nor were there any adhesions. The entrance to the mastoid antrum and Eustachian tube was of normal appearance. The mastoid cells were normal. The Eustachian tube was not narrowed. Hammer and anvil were of natural form and size, with freely movable joint between them. There was also free motion in the anvil-stapes joint. The

made a good recovery. The author states that the intestines were comparatively empty at the time of operation.

RENAL DISEASE FOLLOWING GONORRHOEA.

DR. J. KENNEDY (*New York Medical Journal*, vol. lii., No. 16, p. 483, 1890) reports a case of external urethrotomy for stricture of the urethra and chronic cystitis. The patient died a few hours after operation with absolute suppression of urine. The post-mortem showed suppurating kidneys three times the normal size.

The author considers that gonorrhœa may induce disease of the kidneys in the following ways: By direct extension of the inflammatory process; by interference with escape of urine, as in stricture; by reflex irritation; by the excessive and injudicious administration of diuretics.

A NEW PLATE FOR INTESTINAL ANASTOMOSIS.

DR. T. B. ROBINSON (*New York Medical Journal*, vol. lii., No. 16, p. 429, 1890) offers a new plate for intestinal anastomosis. The plate is made of raw hide, prepared by shaving the hair from the green hide of an ox. The hide is then cut into strips one inch wide by two and a half inches long, and perforated by a diamond-shaped aperture. The plates are armed with four or six sutures and needles. He claims that these plates are eminently suitable for the operation of intestinal anastomosis. They are accessible and easily prepared. They are absorbable, and can be well adapted to the character of the intestinal tract.

The author advises the use of omental grafts in most operations upon the intestines. He has used this method of anastomosis satisfactorily in over one hundred and sixty experiments upon the lower animals.

THE MANAGEMENT OF DAMAGED BOWEL IN STRANGULATED HERNIA.

BENNETT (*The Lancet*, No. 16, vol. ii., 1890, p. 805) reports three cases of strangulated hernia, in which there was present damaged bowel. In the first case there was a lacerated opening into the intestine, through which fæces had escaped into the hernial sac. The opening was closed by buried sutures in the mucous membranes, and by Lembert sutures; the bowel was returned, and the abdomen closed without drainage. The patient recovered easily.

In the second case there was degeneration of the bowel, and a breach of surface involving the peritoneal and muscular coats. The tissues were so softened that suturing was impossible. The bowel was washed and returned just inside the ring, and a large drainage-tube placed in contact with it. Ten days after the operation fæces escaped through the tube. Four weeks after the operation the fæcal fistula had completely closed.

In the third case the sac was stinking and gangrenous, the contained gut piebald in aspect, lustreless, and, so far as could be judged, obviously gangrenous. The gut was returned just inside the ring, and a large drainage-tube was introduced as near the diseased bowel as possible. Recovery took place without the formation of a fæcal fistula.

The author explains the recovery in the last case in this way: By reason

mal was found in the external auditory canal. The dura mater over the temporal bone was very pale, the tegmen tympani thin, and over the antrum transparent. The membrana tympani had in it a heart-shaped perforation, and was greatly thickened and of a grayish color. Microscopic examination of sections of the drum-membrane revealed numerous bone-cells at a point corresponding to the lower edge of a calcareous spot.

CHRONIC CIRCUMSCRIBED INFLAMMATION, WITH A POLYP IN THE EXTERNAL AUDITORY CANAL, THE RESULT OF PRESSURE FROM A WAX-PLUG.

DR. A. EITELBERG, of Vienna, relates a case of the above-named nature (*Wiener med. Presse*, No. 39, September 28, 1890). The history of the case shows that a chambermaid, twenty-two years old, had suffered for two months with a slight, continuous pain in her right ear. There was no tinnitus nor dulness of hearing. The ear had never been previously affected. Examination of the ear revealed on the anterior, lower wall of the auditory meatus at its outer edge a tumor the size of a pea, which proved sensitive and fluctuating when touched with a probe. The skin covering it was neither red nor swollen; the rest of the skin of the canal also appeared normal in this respect. There was a wax-plug in the fundus of the canal, and after the removal of the latter by syringing the membrana tympani appeared macerated, and a polyp was revealed situated at the inner third of the hinder and lower canal-wall. This growth was about five millimetres long and three millimetres wide, flattened, very red, and looked very much like a pointed condyloma. The ear was then stopped with cotton, and the patient seen in two days, when it was found that the tumefaction at the meatus had disappeared, and all pain in the ear had ceased. The polypoid growth, however, was unchanged and bled upon a slight touch with the probe. This growth was then watched for two weeks, but no treatment was applied to it. As it did not change in any way in this time its pointed extremity was touched with a little chromic acid, which was repeated once five days later. After three weeks absence the patient was again examined, when it was found that the polypoid growth had disappeared.

The writer observes that often such polypoid growths undergo spontaneous involution upon the removal of the irritant from the external ear. Even in this case, Eitelberg does not think the two applications of chromic acid destroyed the polypus, but that it really underwent spontaneous metamorphosis. The chief prompting to the publication of this case was the peculiar causation of the polyp, viz., a chronic circumscribed inflammation in the external auditory canal.

INFLUENZA-OTITIS.

LUDEWIG, of Halle, maintains that bacteriological study has not yet settled the identity of grippe (*Archiv f. Ohrenh.*, vol. xxx., September, 1890). The pandemic induced a large number of cases of acute otitis media. In December and January of 1888 and 1889 the number of acute ear cases in the Halle clinic was 39; in the corresponding period of 1889 and 1890 they amounted to 129. There were no pathognomonic characteristics in these cases; hence there was no special form of treatment. "Frequently the inflammation (in

stapes looked normal, excepting an unusual divergence between the crura. Closer examination of the joint between the stapes and the oval window revealed that the base of the stapes was absent and the crura ended free. The oval window was somewhat contracted so as to appear like a slit $2\frac{1}{4}$ mm. long, wider at the anterior end. At this anterior part of the window the free anterior crus of the stapes was fastened. The posterior crus of the stapes rested in the oval pelvis about $\frac{1}{2}$ mm. behind the posterior edge of the oval window, and was bound fast at this point by fibrous adhesion. The fossula of the round window was present, but entirely filled with an osseous mass. The tensor tympani and stapedius muscles were present, apparently normal.

In the *labyrinth* there was no trace of semicircular canals, because that part of the petrous bone which corresponds to their seat was changed into a compact bony mass. The cavity of the vestibule was considerably narrowed in extent and form, and was without a trace of normal membranous contents.

Of the *cochlea*, only the first whorl was discernible, yet this was filled with a sclerotic bony mass.

The internal auditory canal was of normal appearance and width. However, there were no traces of maculæ cribrosæ superiores, mediæ, nor inferiores.

The left temporal bone showed the same changes as the right.

The *auditory nerve* on both sides was present, but considerably thinned.

The *brain* was normal excepting that the lowest frontal convolution on the left side, as also the neighboring convolutions of the island of Reil, was markedly lower and narrower than those on the right side. The furrows between them were wider. The striæ acusticæ were plainly discernible, and the origin of the acoustic nerves was normal.

TWO CASES OF NECROSIS OF THE COCHLEA.

DR. THIES, assistant in the aural clinic of Dr. Trautmann, of Berlin, narrates two cases of the above-named disease (*Archiv f. Ohrenheilkunde*, Bd. xxx., September, 1890). Both of these cases furnish the following corroborations of the observations of others in similar occurrences:

1. The total facial paralysis in such cases may disappear after the cochlea is thrown off as a sequestrum, as in one of the cases.
2. The facial paralysis may continue after the elimination of the cochlea. The latter result is the most common.
3. Absolute deafness is the result in the affected ear.
4. Vertigo and subjective noises may continue, even if only slightly.

OSSIFICATION OF THE MEMBRANA TYMPANI.

An account of this rare occurrence is given by DR. HABERMANN, of Prague, having been observed by him in Kohler's clinic (*Prager med. Wochenschrift*, Sept. 24, 1890). A woman, thirty years old, presented symptoms of profound anæmia, cirrhosis of the liver, and pneumonia of the left lower lobe. Post-mortem examination revealed chronic tuberculosis of the apices and of the peribronchial glands, with other grave lesions of the viscera.

The left organ of hearing was examined by Habermann. Nothing abnor-

disease, as least as it occurs in the United States, that result is limited to a great minority of cases in which the disease is quite favorably located for endo-laryngeal access and rather circumscribed in its extent.

DR. G. HUNTER MACKENZIE, of Edinburgh, in continuing the discussion, expressed his approval of the title of the subject under discussion, which included all laryngeal complications in tuberculosis, whether tuberculous, non-tuberculous, or mixed. In considering the possibility of influencing the organism on which the disease depends, Mackenzie has been struck with the enormous numbers and large size of the bacilli in the expectoration from laryngeal tuberculosis as compared with that from purely pulmonary tuberculosis; indicating to him that laryngeal tuberculosis presents an intense—probably the most intense—form of the disease, entirely apart from complications attendant upon its location. He believes that in the presence of extensive pulmonary disease laryngeal tuberculosis should not be subjected to violent or heroic treatment; a belief, we fancy, that is very generally entertained. Sedative topical treatment, symptomatic in its selection, is the only topical treatment for which Mackenzie sees any justification.

The simple laryngeal catarrh of pulmonary tuberculosis is regarded as a contra-indication to sojourn in high latitudes, which tends to its aggravation.

Tuberculosis in coexistence with syphilis is believed to occur more frequently than is generally supposed. It would be diagnosed by occurrence of tuberculous bacillary sputum in the presence of evidences of syphilis of the larynx, the mouth, and the parts adjoining.

MR. HENRY T. BUTLIN had found his best results in frequent insufflations of iodoform, combined with general remedies. Under this treatment he had known what appeared to be complete recovery in a severe case of pharyngeal and laryngeal tubercle. He had no experience with electrolysis or with curetting.

MR. E. CLIFFORD BEALE had frequently noted adherence for weeks of small masses of inspissated mucus associated with catarrhal lesions of ordinary phthisis. He suggested that these localized lesions are liable to become the seats of tuberculous infiltration if neglected or allowed to pass undiagnosed. In most cases perfect cure could be effected by simple cleansing.

DR. GREVILLE MACDONALD doubted whether all superficial excoriations of the larynx were necessarily tuberculous in tuberculous subjects. He had often observed their spontaneous cicatrization.

The views of other participants in the discussion were mainly in accord with the views of those who opened it. There was a general concurrence as to the impropriety of tracheotomy except when indicated for the immediate or immediately proximate preservation of life in cases with pronounced pulmonary lesion, its performance as a therapeutic measure being generally condemned.

SPONTANEOUS RECESSION OF A LARYNGEAL PAPILLOMA AFTER TRACHEOTOMY.

DR. W. M. COWGILL, of Paducah, Ky., reports (*Medical News*, October 4, 1890) an instance of an extensive papilloma in the larynx of a girl six years of age, whose difficulty in breathing had existed for four years. The intense

the middle ear) attacked the bone, and not infrequently we observed acute caries." One fatal case of consequent pyæmia was observed.

According to the experience in the clinic at Halle, influenza-otitis is sometimes a malignant and life-threatening disease, which, in conjunction with pyæmia and meningitis from empyema of the frontal sinuses, presents the most frequent cause of death, after pneumonia.

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

UNDER THE CHARGE OF

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OF PHILADELPHIA.

TREATMENT OF THE LARYNX IN TUBERCULOSIS.

In a discussion on the treatment of laryngeal disease in tuberculosis held at the late meeting of the British Medical Association (*Brit. Med. Journ.*, Sept. 13, 1890), MR. CHARTERS J. SYMONDS, while approaching the subject from a surgical point of view, which endorsed proper efforts to rid the larynx of local diseases by surgical procedures, called attention to the fact that cicatrization of tuberculous ulceration of the larynx sometimes occurred spontaneously; and he intimated the possibility of such a process having taken place in some of the cases treated by curetting, and frictions with lactic acid. We should feel, however, that a cicatrization in immediate sequence to the procedures mentioned should be undoubtedly attributed to the beneficent influence of the procedure; spontaneous elimination of tubercle and cicatrizations of losses of substance progressing far more slowly.

Mr. Symonds narrated two cases illustrative of spontaneous cicatrization. One occurred under six months' good diet and attractive outdoor exercise and recreation in the country, with recurrence on return to town and a fatal termination. The other cicatrization took place under sedative treatment and the administration of mercury, and remained undisturbed until the patient's death from the constitutional disease; the laryngeal disease having been under observation for two years and three months, its symptoms having existed for more than three years. He referred to a few interesting personal observations of nodular infiltrations, which were partly removed in masses with gouge cutting-forceps, the double curette of Krause, and the remainder submitted to frictions with lactic acid with great benefit. The indications for topical or surgical treatment of laryngeal tubercle are very properly based by Mr. Symonds on the lines followed in the treatment of tubercle in other accessible portions of the body, or, as we should put it, on the general principles of good surgery. One of his conclusions, that endo-laryngeal methods are sufficient to remove and treat the disease in the majority of cases, we cannot endorse. They can be treated, yes; but as to the removal of the

A CURED CASE OF PRIMARY TUBERCULOSIS OF THE PHARYNX.

DR. J. W. GLEITSMANN, of New York, reported (*N. Y. Med. Journ.*, Oct. 11, 1890) to the International Medical Congress at Berlin a case of primary tuberculosis in a female patient thirty-eight years of age, cured by scraping the ulcerating tissues, and energetic frictions with lactic acid, with occasional resort to the electric cauter. Cases of this kind are very rare.

[A cured case of tuberculosis of the pharynx in the compiler's consultation practice was referred to in these columns a few years ago in connection with some pertinent abstracts, but that case did not reach anything like the ravages described in the present instance.]

WITHDRAWAL OF A NEEDLE FROM THE TRACHEA THROUGH THE NATURAL PASSAGE.

An interesting case, very ingeniously handled, has been reported by DR. FRANZ HINRICHS, of Berlin (*Deut. med. Woch.*, Sept. 11, 1890).

A tailor drew a threaded needle into his trachea by aspiration. Laryngoscopically the string projecting from the mouth was seen to extend down the left side of the trachea. The needle lay across the middle of the orifice of the left primitive bronchus, one extremity imbedded in the left wall of the trachea, and the other a little more deeply in the spur of the bifurcation, but it was impossible to distinguish which end was the point and which was the eye of the needle. After failure with a variety of devices at extraction mentioned in detail, withdrawal was accomplished by the following procedure. The point of a long probe was bent into a rectangular hook about half a centimetre in length, and while Dr. Hinrichs held the thread taut, the consultant, DR. SCHIRLER, succeeded under laryngoscopic inspection in passing the hook under the upper end of the needle and in detaching it from the tracheal wall, the point remaining imbedded in the spur of the bifurcation. By means of the sound he was enabled to keep the needle in a proximatively vertical position during its dislodgement by traction upon the thread. During its slow withdrawal it was caught several times under the projections of the rings of the trachea, whence it was as often dislodged with the sound. The last obstacle thus surmounted was the right vocal band. The needle was 3.5 centimetres long, and was rusted to within 1.1 centimetres of the point, and 0.2 centimetre of the eye, the parts imbedded in the tissues having retained their lustre. The operators are to be congratulated on their pluck, skill, and pertinacity, through which they spared their patient the necessity of submission to tracheotomy.

INTUBATION IN SYPHILITIC STENOSIS OF THE LARYNX.

At the late International Medical Congress a paper on Intubation of the Larynx in Acute and Chronic Syphilitic Stenosis (*Med. Record*, Oct. 4, 1890) was read by DR. GEORGE M. LEFFERTS, of New York, strongly advocating the procedure in preference to all others. His personal experience in ten cases is recorded in exemplification of the views maintained in his argument.

dyspnœa required relief, so laryngo-tracheotomy was performed and a canula was inserted. It was subsequently found impossible to remove the growths through the natural passages, and thyrotomy was proposed for gaining access to them, but was objected to by the parents. Little, if any, change ensued for two years. Then evident recession had begun; and in three years and eight months after the tracheotomy it had progressed to such a degree as to leave but a small papilla about one line in length projecting from the posterior wall of the larynx.

CARCINOMA OF THE LARYNX.

At the late International Medical Congress MR. HENRY T. BUTLIN, of London, read a paper "On Radical Operations for the Cure of Intrinsic Carcinoma of the Larynx" (*Brit. Med. Journ.*, August 23, 1890), in which, after reviewing the results in a statistical compilation of 102 operations for intrinsic carcinoma on 95 patients, including 23 thyrotomies, 23 partial excisions, and 51 complete laryngectomies, he concludes that the only hope of success in laryngectomy lies in the first operation, and if this fails there will be little prospect of relief from surgical interference.

He would urge the smallest operation consistent with the widest excision of the disease and the removal of wide area of surrounding tissue, without reference to the removal of one-half of the larynx or the whole organ. He deems it essential to this end that the larynx should be widely opened and examined; for the disease almost invariably occupies a wider area than is disclosed under laryngoscopic inspection.

RHINO-PHARYNGEAL MYXOMA AT SIX YEARS OF AGE.

DR. ALEXANDER MACCOY, of Philadelphia, has reported (*N. Y. Med. Journ.*, Sept. 27, 1890) an instance of myxoma weighing six drachms, which he removed with the electro-cautery snare from the free surface of the vomer of a female child six years of age.

[Myxomas at this early age are very rare. A few weeks ago a rhino-pharyngeal myxoma with multiple attachments, in a boy five years of age, was exhibited and operated upon with forceps at the compiler's clinic in Jefferson Medical College.—ED.]

STENOSIS OF THE LARYNX FROM FOREIGN BODY WITHOUT CHARACTERISTIC SYMPTOMS.

DR. E. KOSSOW-GERRONAY reports (*Wien. med. Woch.*, No. 35, 1890) a case of sudden asphyxia in a patient who had suffered for four weeks with laryngeal pain, hoarseness, and cough, and who had expectorated shreds of membrane. Immediate tracheotomy, artificial respiration, and injections of ether restored the patient. Laryngoscopic examination then disclosed a foreign body beneath the left vocal band, projecting across one-half of the diameter of the trachea. It was subsequently removed by DR. SCHOPF after splitting the larynx, and it turned out to be an embedded fragment of bone surrounded and partially overgrown with granulations. There was no clinical history whatever of the aspiration of the foreign body.

DERMATOLOGY.

UNDER THE CHARGE OF

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HISTOLOGY OF TUBERCULOUS SKIN AFTER INJECTION WITH KOCH'S FLUID.

GUSTAV RIEHL, of Vienna (*Wiener klinische Wochenschrift*, No. 51, 1890), describes the histological changes in a patch of tuberculous skin after the injection of Koch's fluid. Briefly, the changes consist in an acute exudative inflammation with fibrinous and cellular exudation in the immediate neighborhood of the tuberculous infiltration. The changes in the bloodvessels, the formation of vesicles, the abundant presence of leucocytes in the tissues, the deposit of fibrin about the tubercle, in the papillæ, and even into the epidermis, are all signs of inflammation with abundant exudation.

OBSERVATIONS ON KOCH'S FLUID IN DERMATOLOGY.

PROF. PICK, of Prague (*Prager med. Wochenschr.*, No. 52, 1890), experimented with injections of Koch's fluid in 7 cases of syphilis; 3 of rhinoscleroma; 1 of lupus erythematosus; 1 of Addison's disease. In none of the syphilitic cases was there any reaction upon the neoplasmata, though there occurred general disturbance in several cases. In one case of syphilitic condylomata in association with tuberculosis cutis verrucosa, there took place a strong general reaction, and also an intense local action on both tuberculous deposits, corroborating Koch's assertion of the elective affinity of the virus, and of this point being of diagnostic value. In one case of pure rhinoscleroma there was no reaction, but in two other cases of the same disease with tuberculosis of the lungs there occurred general reaction, but without a sign of local action on the rhinoscleroma. Lupus erythematosus showed no irritation. Because of general reaction in the case of Addison's disease, the idea of tuberculosis of the supra-renal capsule suggested itself.

In a second series of experiments, there were thirteen cases of lupus, of whom the majority showed other internal or external signs of tuberculosis. In all cases the typical local and general reaction took place. Of the general symptoms, the frequent occurrence of diverse exanthemata was noted, including urticaria, measly, roseolar, and scarlatinous eruptions. Alarming symptoms occurred in only one case. Pick thinks that the remedy is one of great scientific importance, of priceless value, and a curative agent for tuberculosis.

PARALYSES OF THE LARYNX.

Two cases of unilateral paralysis of one crico-arytenoid muscle, both in females, cured mainly by progressively increasing doses of strychnine sulphate, are reported by DR. FLETCHER INGALS, of Chicago.—*N. Y. Med. Journal*, Sept. 27, 1890.

UNILATERAL PARALYSIS OF THE ABDUCTORS OF THE LARYNX.

DR. BOSWORTH, of New York, has reported to the American Laryngological Association (*N. Y. Med. Journ.*, Oct. 11, 1890) a case of unilateral paralysis of the abductors of the larynx, the result of an attack of bulbar disease with unusual symptoms, and which was apparently caused by suppurative disease of the antrum. After the establishment of the disease of the antrum there was a history of partial motor paralysis of the entire right side of the body from crown of head to sole of foot, associated with absolute loss of the sense of temperature on the left side, but not of the tactile sense. When Bosworth was consulted for the antrum disease, several months after the onset of the paralysis, from which the patient believed himself to have become thoroughly recovered, he noted some failure to appreciate sensations of heat and cold on the left side of the body. Laryngoscopy revealed the right vocal cord lying motionless in the middle line, in a condition of complete paralysis of its abduction. Otherwise the patient was in perfect health, and gave no evidence of any impairments or the ordinary muscular tests of spinal and bulbar disease. Bosworth believes that there had been a thrombosis of one of the small arteries of the medulla in consequence of suppurative disease of the maxillary sinus; and that early reestablishment of the circulation relieved all the paralytic effects save that of abduction of the right vocal cord; the diseased process seeming to have isolated the ganglion which presides over the respiratory function of one side of the larynx.

LARYNGECTOMY.

At a recent meeting of the *Berliner medicinische Gesellschaft*, DR. EUGENE HAHN exhibited a specimen from a patient upon whom he had performed a very extensive operation in 1880. Regional recurrence took place nine years later, and the patient died in 1889 at the age of seventy-eight years. A portion of the hyoid bone, one-half of the larynx, and one-half of the epiglottis had been removed. He also mentioned a case in which he had been compelled to excise a portion of the carotid artery and a portion of the internal jugular vein in order to remove the entire disease. Recurrence ensued, and the patient perished by purulent bronchitis and pneumonia some ten weeks after the operation. This was the only case lost of six laryngectomies Hahn had performed since 1888.

In conclusion, Hahn expressed the opinion that when carcinoma has become so extended as to require extirpation of the entire larynx, it is better, in most instances, to avoid the operation. Favorable results ensue only in those cases in which it is practicable to perform an operation early in the disease.

histologically by a slightly-thickened stratum corneum, a considerably hypertrophied Malpighian layer, and in the papillary and subpapillary layer, the occurrence of epithelioid cells, arranged in groups and lines separated by bundles of connective tissue, and terminating abruptly below the horizontal subpapillary plexus of vessels; together with a peculiar infiltration of fat, affecting the coil-gland epithelium, the middle and papillary layers of the cutis, and the epithelium of the rete Malpighii; and perhaps an atrophy of the sebaceous glands and hair-follicles." The presence and peculiar arrangement of the epithelioid cells, the author considers, would indicate that the growth could probably be, with propriety, classed as a lymphangio-fibroma (Recklinghausen).

SOME OF THE RARER EFFECTS OF PEDICULI.

JAMIESON notes (*British Journal of Dermatology*, vol. i. No. 10) the somewhat rarer effects produced by pediculi under the two headings—Local: 1. Maculæ cærulæ; 2. Pigmentation. And Reflex: 1. The presence or absence of itching; 2. Pyrexia.

The so-called maculæ cærulæ, or taches blenatres, are steel-gray, pea-to-finger-nail sized stains occasionally to be seen on the trunk and the inner aspects of the thigh and arm. They were formerly thought to be indicative of fever, but observation and experiments have shown them to be due to pediculi pubis.

The brownish pigmentation is not uncommon, and results from the hyperæmia produced by the continual irritation of the pediculi corporis and the consequent scratching. It is usually brownish, but exceptionally may be almost black.

As to the reflex effect, itching is the rule, but in a few instances it has been entirely wanting; and, according to Jamieson, in those cases which show maculæ cærulæ. Pyrexia has been noted in rare cases, the temperature reaching several degrees above normal, which has entirely subsided after a bath and change of linen. Two such cases are briefly referred to. The pyrexia, apparently, was due to peripheral irritation; in neither of the cases was there any inflammation of the skin.

OBSTETRICS.

UNDER THE CHARGE OF

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CÆSAREAN SECTION AT THE ROTUNDA HOSPITAL, DUBLIN.

MACAN (*Dublin Journal of Medical Science*, p. 361, 1890) reports the first Cæsarean operation at the Rotunda Hospital in one hundred and thirty years. The patient was a primipara, three feet seven and a half inches tall, and with

RELATION OF LUPUS TO TUBERCULOSIS.

JONATHAN HUTCHINSON (*Lancet*, January 17, 1891) does not believe that there is a disease which, to the exclusion of all others, deserves the name of lupus. No symptom or set of symptoms will enable anyone to recognize with certainty all cases of lupus, because the diseases which have been classed under it are not clearly specialized. It is often quite impossible to diagnose between scrofulous ulcers and lupus, and between ulcerating chilblains and lupus, to say nothing of the rare forms known as acne-lupus, sebaceous-lupus, and those cases on the borderland of lupus erythematosus and lupus vulgaris. "Whenever a chronic inflammation of the skin or mucous membrane, not due to syphilis, shows a persisting tendency to spread at its edges, to produce satellites near it, and to leave a condition of scar behind it, such a process is one of lupus." Nothing is less common than to see a lupus-patient pass into phthisis. Thus the infective material, whatever it may be, is one which finds a suitable home only in cutaneous or mucous structures; if a bacillus, it is a selective one, and keeps to the tissue in which it had its first development. The most typical forms of common lupus are often coincident with good health on the part of the patient, and the absence of any family history of tendency to tuberculosis. The connection between tubercular affections and lupus is far less close than is generally believed. No observer has succeeded in detecting the bacillus in lupus erythematosus, yet it is far more frequently in close association with tuberculous conditions than is lupus vulgaris.

The diseases of the skin, other than lupus, which are supposed to be in association with scrofula and specific tuberculosis, may be referred to. The typical form of scrofula, in connection with suppurative disease of the lymphatic glands and cellular tissue and skin, does not usually assume the conditions known as lupus, but in most instances they are distinct. If lupus is a tubercular disease—i. e., bacillary in origin—it is certainly extraordinary that in gland struma the skin does not assume a lupus-state, nor conversely, that the glands do not suffer in lupus. True tuberculosis of the skin, distinct from lupus and scrofulous ulceration, as described by French and German writers, seems to be almost unknown in Mr. Hutchinson's vast experience. He alludes to the affection. Lichen scrofulosorum is referred to, and is considered scrofulous in nature and distinct from lupus. Lupus verrucosus, the author states, cannot be distinguished from verruco-necrogenica; the latter occurs in persons not otherwise scrofulous, and does not lead to infective tuberculization in other parts or organs. There is no evidence that lupus ever begins from the implantation of tuberculous matter. Lupus is only exceptionally associated with tubercle in the viscera, and it never causes infective gland disease. Mr. Hutchinson thinks that the evidence is in favor of regarding lupus as a specialized form of chronic inflammation rather than the result of infection.

THE SEBORRHÆIC WART.

Careful study of the seborrhæic wart by S. POLLITZER (*British Journal of Dermatology*, vol. ii. No. 21, 1890) shows the formation to be "characterized

chances for the child's life at the risk of the mother's. In selecting methods of stimulation, he places first repeated subcutaneous injections of sulphuric ether. The patient should drink hot water in considerable quantities. Fluid enemata may also be given. In severe cases auto-transfusion should be performed by bandaging the legs. The best method of direct transfusion is the injection in the infra-clavicular or inter-scapular regions of six-tenths per cent. salt solution at a temperature of 100° F. A simple funnel with India-rubber tubing and needle are all that are requisite. In post-partum hæmorrhage after placenta prævia the tampon of iodoform gauze will be found of value.

THE INTRA-UTERINE TAMPON AFTER PLACENTA PRÆVIA.

AUDREY (*Archives de Tocologie*, No. 10, 1890) reports two cases of placenta prævia in which hemorrhage persisted after the delivery of the fœtus, and was checked by the use of a tampon of iodoform gauze after the failure of other methods. The tampons in each instance were allowed to remain undisturbed for twenty-four hours, and in both cases uncomplicated recovery ensued.

RUPTURE OF THE MEMBRANES TWENTY-FIVE DAYS BEFORE THE BIRTH OF A LIVING CHILD.

EGAN (*Medical Record*, p. 457, 1890) reports the case of a multipara who had had four miscarriages, the causes of which had not been ascertained. When the os was dilated to the size of a dollar, the head presenting, the membranes ruptured. The pains were trivial in character, and the head receded and descended alternately. A hypodermic injection of half a grain of morphine in four doses produced a night's rest. The pains continued ineffective, and the patient resumed her household duties until twenty-five days after the rupture of the membranes, when a living child was expelled. But one opening could be found in the membranes.

PUERPERAL ENDOCARDITIS AND ITS PULMONARY COMPLICATIONS.

LUZET and ETTLINGER (*Archives Générales de Médecine*, January, 1891) have found that puerperal endocarditis of septic origin occurs most frequently upon the right side of the heart. The infection spreads thence to the lungs. The course of the disease is prolonged, and its duration several months. Pulmonary complications are the rule. They are caused by multiple septic emboli, whose formation and deposit occur so slowly as frequently to give rise to a diagnosis of tubercular disease. When the infection is mild in character the patient very often survives.

A SECOND TUBAL GESTATION DIAGNOSTICATED AND REMOVED BEFORE RUPTURE.

HERMAN (*British Medical Journal*, No. 1552, 1890) reports the case of a multipara from whom he had removed a ruptured tubal pregnancy from the right side. Over three years afterward ectopic pregnancy upon the left side

a considerably contracted pelvis, the true conjugate being two inches. The usual Cæsarean operation was performed, the uterus being closed by silk by the method employed by Fritsch, and an elastic ligature having been used to control hæmorrhage. An uncomplicated recovery followed the operation.

THE CÆSAREAN OPERATION.

GOULLIoud (*Archives de Tocologie*, No. 11, 1890) reports a case of Cæsarean section in a woman presenting a contracted pelvis, the true conjugate measuring two and one-third inches, the shoulder presenting, the amniotic liquid having escaped eighteen hours before admission to the hospital, and the child still living. Basiotripsy had been performed a year previous upon the same patient. On examination it was found impossible to make version, and accordingly Cæsarean section was done. The uterus was closed with chromic-acid catgut. The sero-serous suture was carefully made with fine catgut, and the usual antiseptic dressings applied. The patient's temperature and pulse rising after the operation, the lower angle of the wound was opened, and a rubber drainage-tube inserted and antiseptic injections were made. Recovery of mother and child followed.

MENINGEAL HÆMORRHAGE IN THE NEWBORN.

RICHARDIERE (*La Médecine Moderne*, No. 44, 1890) reaches the following conclusions from a medico-legal study of cases of meningeal hæmorrhage in the newborn: These hæmorrhages are a frequent cause of death, and occur at the moment of birth. They differ from similar hæmorrhages in the adult by the absence of inflammation of the arachnoid and of the dura mater. They are usually accompanied by sub-pleural ecchymoses. Death generally results suddenly. The cause of the hæmorrhages is traumatism occurring during labor, and especially traumatism upon the foetal head at the moment of its passage through the bony pelvis.

THE TREATMENT OF PLACENTA PRÆVIA.

HART (*Edinburgh Medical Journal*, p. 416, 1890) defines a normal insertion of the placenta as being above the level of the lower uterine segment. Placenta prævia exists in those cases where part of the placenta dips into the lower uterine segment. He would not call hæmorrhage in such a placenta accidental hæmorrhage, but would restrict the term to bleeding caused by separation of the placenta when normally situated. He has found by observation that although the arterial supply of the lower uterine segment is not increased in placenta prævia, the venous circulation is markedly so.

Regarding treatment, it is of cardinal importance to prevent loss of blood. Prolonged interference should be avoided, thorough antisepsis maintained, and the interests of the mother held to be paramount. When definite hæmorrhage has come on, chloroform should be given, the cervix dilated to admit two fingers, bipolar version performed and a foot brought down, and delivery should be allowed to proceed spontaneously. Rupture of the membranes is admissible only in minor cases. Regarding the plan of complete dilatation with Barnes's bags and rapid delivery, Hart believes that it increases the

OVARIAN GESTATION.

A case of this rare pregnancy is reported by REEVES (*Lancet*, p. 872, 1890). The patient was a multipara, who complained of pain from a pyriform tumor in the centre of the abdomen, which was smooth and tense, and projected anteriorly. This tumor was not connected with the uterus. Her history was that of previous miscarriage with derangement of menstruation, and irregular flow followed. Fœtal movements were felt, and attacks of sudden pain had been experienced. The uterus was enlarged. On laparotomy a cyst was found in the centre of the abdomen which, when punctured, yielded three ounces of thick, yellowish fluid. The sac was then opened, and a dead child and a macerated placenta were delivered. The broad ligament was then tied in a double ligature close to the uterus. No trace of the ovary upon the left side could be found; the right ovary was sclerotic and was left. The pedicle was treated within the abdomen, and a glass drainage-tube was employed. A further examination of the case revealed an ovarian, ruptured pregnancy.

TUBAL PREGNANCY WITH RUPTURE AT AN EARLY STAGE.

DRAPER (*Boston Medical and Surgical Journal*, January 8, 1891) reports a case of tubal pregnancy in a young primipara admitted to the hospital in shock from ruptured tubal pregnancy. The case proved rapidly fatal, and upon post-mortem examination three quarts of blood were found in the peritoneal cavity. The tissues were blanched from loss of blood; the location of the ovum was found in the left Fallopian tube. Microscopic examination revealed a ruptured ovum at between the first and second months.

A CASE OF ECTOPIC GESTATION WITH OPERATION AT THE NINTH MONTH.

CUSHING (*Ibid.*) reports the case of a primipara in whose abdomen a large irregular mass could be outlined. A placental souffle could be heard but no fœtal heart-sounds. Upon laparotomy a cyst was discovered. The peritoneum was very thick and vascular, the lower portion of the sac was formed of the Fallopian tube adherent to the surrounding tissues. The upper half of the placenta was in a state of fatty degeneration, and was easily removed, the placenta tearing readily. The remaining portion was retained in the fœtal sac, but was removed without severe bleeding, and the sac stuffed with iodoform gauze. The Fallopian tube was ligated, and the abdominal cavity thoroughly washed out with hot water, and two drainage-tubes were inserted. The patient's recovery was uneventful. Examination showed that the child was between eight and nine months advanced. It had apparently died from twist of the cord near the umbilicus.

THE PROTEIDS OF MILK.

HALLIBURTON (*Journal of Physiology*, vol. ii., No. 6, p. 463) arrives at the following conclusions from an interesting study of the proteids of milk: The principal proteid called *caseinogen* is precipitated by certain neutral salts, or by acetic acid, and may be most satisfactorily prepared by combination of

of the uterus was diagnosticated. Upon laparotomy the pregnancy was found to be tubal and unruptured. The tube was removed, and measured two and a half inches long, and one and a half inches at its widest part. It contained a foetus one third of an inch long. The wall of the tube was three-eighths of an inch thick, resembling the placenta in ectopic gestation. The case is interesting from the diagnosis made before rupture; the occurrence of ectopic gestation in first one tube and then the other, and the duration of the pregnancy, which was about three months. The embryo had died at the end of the first month, and hæmorrhage had taken place into the chorion.

THE TREATMENT OF SYPHILIS DURING PREGNANCY.

BESNIER (*Journal de Médecine*, November, 1890) has obtained good results in the treatment of syphilis, during pregnancy, by the administration of cinchona wine and syrup of the iodide of iron as tonics, together with nourishing food. The patient also took daily a pill containing one-sixth of a grain of bichloride of mercury combined with one-twelfth of a grain of extract of opium and one-twelfth of a grain of extract of gentian, the whole rubbed up with glycerin. Iodide of potassium was also advised in amounts of from seven and a half to fifteen grains daily.

RECENT RESULTS FROM THE STUDY OF LABOR BY FROZEN SECTIONS.

BARBOUR (*British Medical Journal*, No. 1557, 1890) concludes from the study of frozen sections of a patient during labor, that the retraction of the uterus changes remarkably the thickness and consistence of the uterine wall. These walls are always in apposition, except when the placenta and membranes remain in the upper uterine segment. After their removal the uterine walls come into apposition. Regarding the diminution in the size of the oblique diameters at the pelvic brim, he finds that, excluding a loop of intestines, the thickness of the soft parts at both ends of the oblique diameters is in all about seven-eighths of an inch. In estimating, then, the available space in these diameters, we must deduct almost an inch from measurements made upon the bony pelvis. Below the brim the shortening becomes more marked through the *obturator internus* and the cellular tissue of the broad ligament containing venous sinuses. These sinuses are compressed during labor.

DEATH FROM LATENT HEART DISEASE.

BARTAUZ (*Journal des Sages-Femmes*, November 1, 1890) reports the death, three hours after labor, of a well-nourished patient, who had suffered shortly before the end of labor with dyspnoea and failing heart-action, which treatment did not relieve. An old endocarditis was found in the left ventricle and the mitral orifice greatly contracted. Extreme pulmonary congestion with nutmeg-liver and beginning sclerosis of the kidney were present. Thirteen years before her last pregnancy the patient had rheumatism and endocarditis with valvular affection. The amount of hypertrophy was slight; pregnancy had resulted in heart-strain, and variation in blood-pressure caused by labor terminated in the death of the patient.

are to be selected, else valuable time may be lost in trying to relieve a patient by electricity who must eventually be brought to the operating-table, too late for the successful performance of myotomy. The writer believes, with Apostoli, that the effect of the positive pole within the uterus is purely a local cauterization, the chlorine which is set free exerting a powerful antiseptic action.

THE TECHNIQUE OF OPERATIONS FOR VESICO-VAGINAL FISTULA.

MARTIN (*Proceedings International Medical Congress, 1890*) describes a case of fifteen years' standing in which the entire vesico-vaginal septum with the upper portion of the urethra was missing, the cervix uteri being deeply torn. Two unsuccessful attempts at closure were made. After rendering the urine acid and healing the extensive erosions on the external genitals, the writer undertook to close the fistula. An incision was made through the healthy vaginal mucous membrane surrounding the opening; the laceration of the cervix was then closed, and the flap of vaginal mucosa was slid over the fistula and the opposite edges united. The raw surface in the anterior vaginal wall was next covered as in an anterior colporrhaphy. In spite of the amount of cicatricial contraction, and the presence of an intense vesical catarrh, the wound healed with the exception of a small opening in the cervix, which it was easy to cure by a subsequent operation. The disposition of the flap was similar to that employed by Volkmann in the operation for ectopion vesicæ.

ELECTRO-THERAPY IN GYNECOLOGY.

PROCHOWNICK (*Ibid.*) has applied this treatment carefully in 110 cases, with the following results: Fourteen patients with uterine fibromyoma were treated, seven on account of hæmorrhage, which was checked with either arrest of growth or diminution in the size of the tumor; three applied on account of pain and were entirely relieved. The applications were repeated at intervals of from three to five days and were continued for two or three months. The writer believes that this treatment is absolutely free from danger so long as one practises rigid antisepsis and avoids galvano-puncture, refraining from downward traction upon the cervix. Assuming, with Martin, that 80 per cent. of all fibrous tumors are of a benignant character, perhaps one-third of these may be successfully treated with hot injections, ergot, hydrastis, etc. The remainder, especially growing tumors associated with pain and hæmorrhage, are best treated by electricity. Too few have yet been kept under observation for several years to enable us to determine if the benefit is permanent after cessation of the treatment. Apostoli himself admits that many patients have a recurrence of their symptoms after the lapse of a year, or a year and a half. The fact that some fibroids become cystic can hardly be attributed to the use of the continuous current, since this change may occur even where no treatment has been instituted. Some fibrous tumors continue to grow in spite of treatment, others are associated with malignant degeneration of the endometrium, and many become malignant or rapidly undermine the general health; in these cases there is no alternative save a radical operation.

these two methods. The term *casein* should be applied to the curd formed from caseinogen by the action of rennet. In the classification of proteids, casein should be grouped with other insoluble proteids like fibrin and gluten formed by ferments from more soluble albuminoids. Caseinogen should be placed in a new group including it and the proteid of whey. These bodies are similar to the globulins, the chief difference being that their solutions are not coagulated by heat. Lact-albumin resembles closely serum-albumin; it differs, however, in specific rotatory power, in its heat-coagulation and its precipitation by neutral salts. Caseinogen and lact-albumin are the only proteids contained in milk. Other proteid bodies supposed to have been isolated in milk have not existed as such. The body called *whey*, a proteid formed in rennet fermentation, should be included with caseinogen in a new class of proteids allied to the globulins.

THE CAUSES AND TREATMENT OF POST-PARTUM HÆMORRHAGE.

SCHAUTA (*Prager medicinische Wochenschrift*, No. 53, 1890) writes of the treatment of post-partum hæmorrhage in a practical and interesting manner. In seeking for the cause of hæmorrhage, the practitioner must remember that while atony of the uterus is the most frequent cause, yet others may be present of equal importance. Such are failure of the uterine muscle properly to retract and close the mouths of the uterine sinuses; dilatation, degeneration, and atheroma of the bloodvessels of the uterus; retained portions of placenta; lacerations of the genital tract opening bloodvessels; varicose veins which have been ruptured during labor; bleeding from rupture of the uterus at the lower uterine segment; tumors, especially myomata and carcinomata, which become bruised and lacerated during labor. In the treatment of these cases it is essential that the placenta be delivered in such a manner as best to avoid uterine relaxation and hæmorrhage. Schauta wisely advises that no effort be made to express the placenta during the first half-hour following delivery; he would even adopt Ahlfeld's suggestion, and allow two or three hours to elapse before removing the placenta manually. The Credé method is preferred when expression is possible.

In the treatment of hæmorrhage caused by uterine atony, uterine massage is indicated and also hot douches; these are best given of sterilized water, or of some antiseptic solution, bichloride of mercury not being considered applicable in these cases. Ergotine may be given by hypodermic injection; the intra-uterine application of styptics is strongly condemned. The intra-uterine tampon of iodoform gauze is warmly commended, and has given none but good results in Schauta's hands. In cases where a hæmorrhage is persistent and severe, the blood coming from degenerated vessels in the site of the placenta, it may be necessary to adopt a procedure advised by Kocks. This consists in inverting the uterus as soon after the birth of the child as possible, and applying an elastic ligature about the cervix. In addition, iodoform gauze may be used as a tampon. After six hours the elastic band may be removed and the uterus replaced. When hæmorrhage results from retained portions of placenta, the thorough exploration of the uterus and the removal of such portions will promptly check the hæmorrhage. Hæmorrhage from lacerated wounds in the genital tract is best controlled by suture,

oöphoritis, and once where the same treatment was employed in the case of an ovarian cyst, which was mistaken for a fibroid. In thirty instances pregnancy followed the use of intra-uterine applications.

THE RESULTS OF TREATMENT BY APOSTOLI'S METHOD.

CUTTER (*Ibid.*) calls attention to the fact that in 1871 he treated a case of uterine fibromyoma by galvanism, following essentially the method subsequently developed by Apostoli. In his experience he had found that the growth of the tumor was arrested in 50 per cent. of his cases, that there was slight improvement in 6 per cent., no diminution in the size of the tumor in 14 per cent., and more or less complete disappearance in 22 per cent. His mortality was 8 per cent. With the patient anesthetized, he introduces both electrodes through the abdominal wall into the tumor and allows the current to pass for five or ten minutes, rest in bed being enjoined for several days subsequently with restricted diet, two-thirds meat and one-third vegetable; diet he regards as extremely important.

DRAINAGE AFTER LAPAROTOMY.

SÄNGER (*Med. Anzeiger zum Centralblatt für die ges. Medicin*, August 30, 1890) reviews the literature of this subject, tracing the evolution of drainage from Koeberlé to Hegar. Drainage may be effected by glass tubes, by tamponade with absorbent gauze, or by the two combined. The writer prefers the latter method, using slightly-curved tubes with a diameter of two-fifths of an inch, having small, lateral perforations one-twenty-fifth of an inch in diameter; these are boiled and are kept in a solution of bichloride, 1 : 500. After removing the fluid from the tube, previous to applying the dressings, it is stuffed with aseptic gauze, which is not changed for twenty-four hours. No syringe is used to withdraw the fluid. The drainage-tube is removed on the third or fourth, though occasionally not until the sixth or eighth day. The writer believes that drainage acts as a "safety-ventilation," allowing the discharge of secretions which, if retained within the cavity, would serve as a nidus for septic infection.

The use of a gauze-drain alone has certain disadvantages, since the portion within the pelvic cavity soon becomes soaked and ceases to act as a capillary drain; it is then impossible to change it, since if it is drawn out the fluid is squeezed back into the cavity. Even when it is necessary to tampon on account of obstinate oozing, it is better to use a glass tube with the gauze. It is not necessary to resort to "ventro-vaginal drainage," as recommended by Martin in cases of myomectomy, since all secretion can be thoroughly removed through the abdominal drain.

Drainage should be employed under the following circumstances:

1. When there exist at the time of the operation circumscribed collections of blood or decomposed fluid, which exceed in virulence the absorptive power of the peritoneum.
2. When it is probable that there will be a subsequent secretion of fluid which may serve as a focus of infection.
3. When there has been an injury to the bladder or gut and there is a chance that their contents may escape into the cavity.
4. When it is desirable to shut off large raw surfaces from the general peritoneal cavity.

Twenty-two cases of chronic perimetritis, associated with ovarian and tubal disease, were treated with more or less success. In twelve cases, in which a gonorrhœal history was absent, pain and hæmorrhage were the principal symptoms; eight were permanently relieved by a current of 100 to 150 milliampères (the greatest number of *séances* being fifteen), two could not bear the treatment, and in two cases it was necessary to perform laparotomy. Less favorable results were obtained in the case of the ten patients whose condition was due to gonorrhœal infection; five were entirely relieved, two somewhat, and in two fresh inflammation was set up. Of course it is not claimed that an anatomical cure takes place in cases of pyosalpinx, although the tumor sometimes appears to grow smaller, but the distressing pains, hæmorrhage, and vaginal discharge are certainly relieved, and frequently. Greater care must be used in the introduction of the sound than in cases of fibromyoma, and more attention must be paid to the after-treatment of the patient. The current used in the treatment of perimetritis should not exceed 150 milliampères. The writer did not continue the treatment longer than three months, giving two *séances* a week; his patients were made to rest for two hours after each application.

THE GALVANIC CURRENT IN GYNECOLOGY.

APOSTOLI (*Ibid.*) states the following as his present views upon the subject:

1. The principal value of the constant current is in its action in cases of fibroid tumors and endometritis, especially where pain and hæmorrhage are constant symptoms. It not only arrests the growth of benignant tumors, but promotes the absorption of peri-uterine exudations. It is absolutely contra-indicated in acute suppurative inflammation of the adnexa.

2. The galvanic current possesses a polar and an interpolar action, the latter being of a trophic and dynamic character, the former thermic and antiseptic.

3. The more powerful currents (above fifty milliampères) possess these advantages: *a.* They influence the circulation through the development of heat (*drainage circulatoire*). *b.* They are antiseptic and germicidal. *c.* Their effect increases as the square of current-strength. *d.* They can be easily employed by the general profession. *e.* The stronger the current employed the less the probability of a return of the symptoms.

4. Intra-uterine galvanization is preferable because by it the maximum effect is obtained, the antiseptic action of the positive pole is secured, direct cauterization is effected, and there is less pain than in the intra-vaginal method.

5. In proper cases galvano-puncture by means of a fine gold needle, insulated up to within one-fifth of an inch of its point, enables the operator to concentrate the action better and to produce a more powerful effect with weak currents.

6. As compared with the application of caustics and curetting, intra-uterine galvanization is far more harmless, as shown by the writer's experience, who, between July, 1882, and July, 1890, had practised the latter 11,499 times with only three fatal results—once in a case of galvano-puncture for subperitoneal fibroma, once in a case of galvano-puncture for salpingo-

of the body, the gastric mucous membrane alone being excepted, also in mixtures of all the secretions of the body, invertin may be found if the mixtures are exposed to the air long enough for the development of bacteria.

STERILIZED MILK AND ITS USE IN NOURISHING CHILDREN.

In an article on this subject EISENBERG states that (*Jahrb. f. Kinderh.*, xxxi. 1 and 2) a danger in the use of animal milk for the nourishment of children consists in the fact that unless it is taken by the child immediately after being drawn from the udder of the animal it will contain germs which are the result of decomposition and fermentation.

Pasteur showed that the decomposition of milk is effected by germs which exist in the air, and that these germs possess activity to a marked degree.

Hueppe showed that there were two varieties of such germs—acid-forming and lab-forming, and that perfect sterilization could easily be accomplished. Soxhlet devised an apparatus by which a given quantity of milk could be reduced to a proper consistency by boiling in a water bath for forty minutes. Hochsinger devised a plan for sterilizing milk for infants on a large scale, and it can now be obtained in the shops thus prepared. By the author's method of sterilizing milk for family use, a suitable metallic frame with places for twelve bottles is provided. These bottles being graduated in cubic centimetres, the milk may easily be reduced to the desired consistency. The bottles are provided with stoppers which seal them hermetically, and are to be boiled in a water-bath for thirty minutes. The nipple must be adjusted to the bottle immediately before it is to be used. After use the bottles should always be washed with soda, sand, and water.

THE PHYSIOLOGY OF STOMACH-DIGESTION IN INFANTS.

VAN PUTEREN reports the following experiments (*Jahrb. f. Kinderh.*, xxxi. 1 and 2): The contents from the stomachs of 248 healthy breast-nourished infants obtained by irrigation, were utilized in the author's investigations. Their ages varied from two to forty-one days. In all, 1027 examinations were made. A simple Jaques catheter introduced into the stomach, and lightly pressed against its wall, was used in the experiments for determining the quantity and quality of the acid- and lab-ferments of the stomach. Washings of the stomach with distilled water at 35° C. were used in determining peptonization, and the duration of digestion, and in the latter procedure a glass cock, with double bore and containing three glass tubes, was employed. The contents of the stomach were withdrawn at intervals of ten or fifteen minutes during the period of digestion. The author considered the following points:

1. Duration of ingested milk in stomach. Sixty to eighty grammes were taken by each child during the first month of life at each meal. The contents of the stomach could be easily withdrawn during an hour and a half following their ingestion. Irrigating with distilled water they could be obtained for two hours and twenty minutes, providing that not less than twenty to forty grammes were taken at a meal. This material thus obtained was not alkaline, and contained no bile, hence was from the stomach. The

PÆDIATRICS.

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INVERTIN FERMENT IN THE ANIMAL ORGANISM.

According to MANFREDI (*Jahrb. f. Kinderh.*, xxxi. 1 and 2), there are various opinions, and there have been various expressions, as to the occurrence and origin of invertin ferment in the stomach and intestinal canal. It is generally admitted that such a ferment, a product of glandular secretion, exists in the intestinal canal, and by some that it also exists in the stomach. The fact that numerous bacteria possess the properties of invertin, and that this ferment has even been separated from them, makes it quite possible that it may be generated by them in the intestinal canal. The author's paper is based upon investigations upon the intestinal canal of the guinea-pig and the dog in order to determine this question. His method consisted in taking intestinal secretion, and an infusion of the intestinal mucous membrane, also a filtrate of both freed from bacteria by Chamberland's filter, and testing it quantitatively as to its invertin action upon solutions of cane sugar. The following are his conclusions :

1. The presence of numerous bacteria, which are the source of invertin in the intestinal canal, in connection with the constant presence of the ferment in the intestinal secretion, demand new investigations in regard to the digestion of cane sugar.

2. Previous investigations upon this subject are of no value, partly on account of faulty methods, and partly because commercial cane sugar always contains a small quantity of glucose.

3. The causes of the so-called spontaneous production of invertin from cane sugar and its solutions are the microorganisms which are derived from the air and may possibly be converted into invertin. Spontaneous conversion into invertin can be prevented by careful sterilization, the use of five per cent. carbolic acid solution, filtration through Chamberland's filter, and precautions against germs of all sorts.

4. Invertin is not produced in the stomach where under normal conditions there is no development of bacteria. Those opinions are erroneous which hold that invertin may be produced in the stomach by the action of the acid of the gastric juice, by the gastric mucus, or by a particular gland secretion.

5. In the intestinal juice, which normally contains many bacteria susceptible of conversion into invertin, this substance is constantly found in considerable quantity. In the guinea-pig it is exclusively due to the action of microorganisms. In the dog it probably has a similar origin.

6. In other organs, especially in the liver, the ferment is not present.

7. In solutions or mixtures made by combining portions of all the organs

4. On the first day of life the change of air is very small in volume; it increases until the third day, and then sinks a little, subsequently rising again. At the end of the first week its volume is about one-quarter greater than on the first few days.

5. The lungs are not filled with the first few respirations, as a rule, the alveoli not being well distended until about the second day.

6. The respiration-curves in the newborn show no pauses.

DIABETES MELLITUS IN CHILDREN.

STERN (*Arch. Ital. di Ped.*, 1890) gives the records of 117 cases of this disease in children, found by the author, of which 75 were published prior to 1876. Since many cases are never reported, it can hardly be said that the disease is a very rare one. The disease was found to be more frequent in females in the ratio of 5:3. Among adults males are more frequently attacked. Six of the 117 cases were seized during the first year of life, the others between the first and fifteenth years. Heredity was an important etiological factor, neuropathic as well as diabetic tendencies in parents predisposing to the disease. Other etiological factors were Werlhoff's disease, measles, malarial fever, cold, typhoid, and the excessive use of sugar. There may be a traumatic origin, especially if blows have been received upon the head. The quantity of urine passed may range from 1500 to 4000 grammes daily. Albumin as well as sugar may be in the urine, and there may be a trace of acetone or aceto-acetic acid. In the cases analyzed there was little elevation of temperature. With some there was anæmia, with others eczema, furuncles, abscesses, caries of the teeth, labial herpes, lingual psoriasis, and scrofula. The hearing was sometimes affected, and there were several cases of cataract. Indigestion was not infrequent, but the heart and bloodvessels were seldom affected. In a number of cases death was preceded by diabetic coma. The duration in 35 cases varied between two days and five years. In 14 cases there was complete cure, in 7 improvement, in 4 no improvement, and in 52 the result was fatal. The treatment is mainly a matter of diet. The carbonates and salicylates may be beneficial, but there is no certainty in the matter.

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quantity in the stomach diminished rapidly during the first hour, and in two hours there were not more than twenty to thirty cubic centimetres, this disappearing slowly during the next half-hour.

2. The contents of the stomach were less decidedly acid than is the case in adults. Increasing acidity was evident as digestion progressed, 741 filtrations being made. The acidity was most marked ninety-five minutes after eating.

3. Character of the acid contents of the stomach: Methyl-violet gave positive results for hydrochloric acid, and Uffelmann's reagent for lactic acid. During the first two months of life hydrochloric acid is that which is normal for the stomach.

4. Anti-fermentative power of the stomach contents: Plate cultures were made at once, and after two hours withdrawal of material withdrawn immediately after nursing and at various subsequent periods, the nutrient medium being a mixture of skimmed milk, albuminate of soda, and eight per cent. of gelatin. No perceptible difference was observed in the microorganisms obtained by the two methods.

5. The presence of lab-ferment: The tests which were used gave a negative result with infants under twenty days old; with somewhat older ones there was weak coagulation, while the influence of lab-ferment was very plain in infants of from twenty-nine to forty-one days.

6. The peptonization of albuminates: Ewald's method was accepted, according to which albumen was seldom found, and only in the course of the first hour. Peptone and syntonin were present from twenty-five minutes after eating until the end of digestion. Propeptone was found in thirteen out of fifty-three cases. Sugar and fat were always found, but as long as peptone was present in the stomach the fat could not be converted into fatty acids by the action of ether.

This method of investigation has heretofore been little used for the study of the functions of the infant stomach. Raudnitz and Leo have studied the subject in this manner—that is, by irrigation of the stomach and examination of the washings, but only to a limited extent. The author's investigations have been far more extensive, and he has given exact data in regard to the presence of hydrochloric acid. He has also been able to deny the presence of lactic acid under normal conditions. He was unable to verify Leo's statement as to the presence of lab-ferment in the infant stomach prior to the twenty-fourth day. Further studies on this subject are very desirable.

THE MECHANISM OF RESPIRATION IN THE NEWBORN.

In discussing this subject VON DOHRN gives the following (*Jahrb. f. Kinderh.*, xxxi. 1 and 2) conclusions:

1. The breathing of newborn infants is mainly thoracic.
2. In forced respiration, the raising of the thorax begins at the upper part and extends downward.
3. The exchange of air in the newborn, in ordinary respiration, averages thirty-five cubic centimetres, and increases with forced respiration to a maximum of one hundred and twenty cubic centimetres. In the newborn the exchange of air is about a quarter of the entire volume respired, while in adults it is only about one-tenth.

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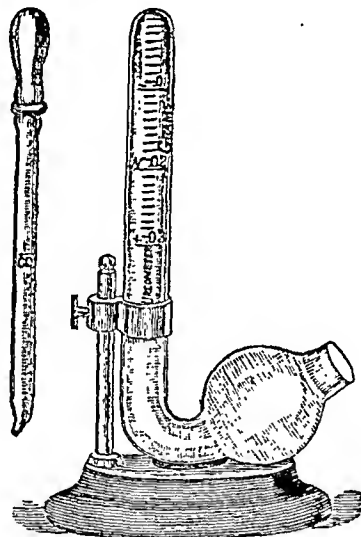
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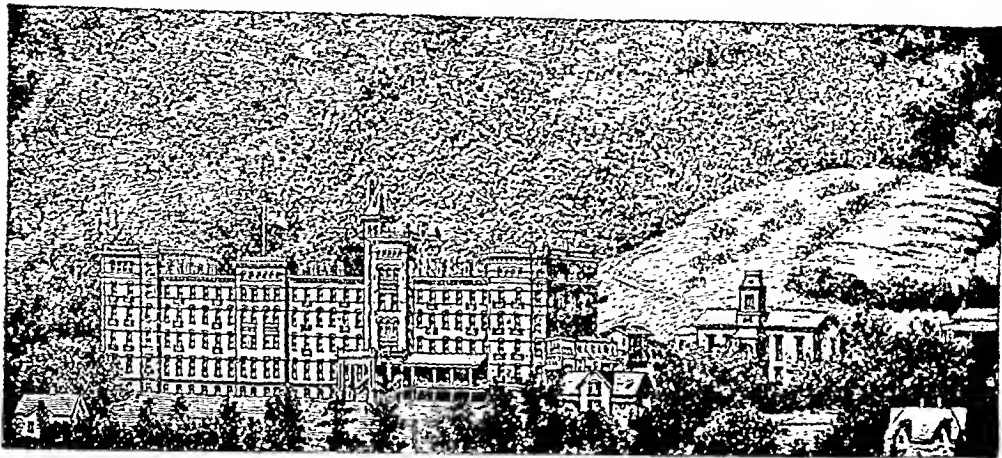
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SURGERY.

	PAGE		PAGE
Present Position of Antiseptic Surgery	412	The Management of Fractured Limbs	415
Resection of the Sacrum in Intra-pelvic Operations	414	Cysts of the Pancreas	416
Hydatid Cyst of the Spleen	415	Contusions of the Abdomen	416
		Stab-wound of Thorax and Abdomen	417

OTOLOGY.

Otorrhagia in Cirrhosis of the Liver	418	Pyoktanin in Ear Disease	419
Bacteriology of Contents of Eustachian Tube in Chronic Catarrhal Inflammations of the Middle Ear	418	Pyæmia and Thrombosis of Jugular Vein from Otitis Media	419
		Fatal Ear-diseases	420

OPHTHALMOLOGY.

The Operative Treatment of Ptosis	421	Indications for Enucleation or Evisceration of the Eyeball	423
The Division of Anterior Synechiæ	422	Quinine Blindness	423
Glioma of the Retina	422		

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

Ethyl Bromide in Operations in the Nose and Rhinopharynx	424	Electro-caustic Amygdalotomy	425
Suppuration of the Maxillary Sinus	424	Carcinoma of the Œsophagus, with Involvement of the Twelfth Dorsal Vertebra	426
Erysipelas of Pharynx and Larynx	425	Perichondritic Abscess of the Larynx Without the Usual Symptoms	426
Pharyngeal Syphilis Fatal by Ulceration of the Internal Carotid Artery	425		

DERMATOLOGY.

Koeh's Treatment of Lupus at the Vienna General Hospital	427	Dermatitis Herpetiformis	429
Koeh's Fluid in Lupus	427	Observations on Prurigo, Clinical and Pathological	429
Observations on the Question of Dühring's Disease	428	A Case of Rhinophyma—Operation	429

OBSTETRICS.

Koeh's Lymph in Nursing-children	430	Results of Enlargement of Lymphatics in Puerperal Septic Infection	432
Gunshot Wound of Pregnant Uterus	430	Epilepsy Produced by Forceps Injury	432
Congenital Narrowing of the Vagina	431	Concealed Accidental Hemorrhage During Labor	432
Pathological Dentition	431		
Lysol, a New Antiseptic in Obstetrics	431		

GYNECOLOGY.

Hæmatocele and Hæmatoma	433	Trendelenberg's Posture for Gynecological Examinations	435
On Thure Brandt's Method	433	The Treatment and Curability of Carcinoma Uteri	435
Treatment of Uterine Fibromata and of Salpingo-oöphoritis by the Constant Current	434		

PÆDIATRICS.

External Paralysis after Diphtheria	436	The Epidemic of Grippe in Children	437
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CONTENTS.

ORIGINAL COMMUNICATIONS.

	PAGE
A Case of Leucocythæmia in a Child. By JOHN THOMSON, M.B., F.R.C.P. Ed., and ROBERT MUIR, M.D.	329
A Case of Successful Removal of a Retro-peritoneal Fatty Tumor. Vein, supposed to be the Left Common Iliac, Torn and Tied. By JOHN HOMANS, M.D.	338
Spurious Pregnancy. A Critical Treatise from a Practical Experience. By F. W. N. HAULTAIN, M.D., F.R.C.P. Ed.	342
Treatment of Inflammation of the Eustachian Tubes. By RALPH W. SEISS, M.D.	345
Hæmo-hydro-nephrosis, due to a Slight Injury; Drainage; Recovery. By GILBERT BARLING, B.S., F.R.C.S.	352
The Selection of Cases of Insanity for Different Methods of Private Care. By HENRY R. STEDMAN, M.D.	355
The Malarial Element in Ophthalmalgia. By H. C. COE, M.D.	365
Three Hundred Cases of Intubation of the Larynx for Diphtheritic Croup. By DILLON BROWN, M.D.	367
Chronic Purulent Otitis Media as a Cause of Persistent Facial Neuralgia. By EDWARD B. DENCH, M.D.	373
A Clinical Study in the Diagnosis and Treatment of Hyperphoria, with a Report Four Cases. By HOWARD F. HANSELL, M.D.	377

REVIEWS.

A Text-book of the Diseases of the Ear. By Josef Gruber, M.D.	387
A Treatise upon Clinical and Operative Gynecology. By S. Pozzi.	391
A Practical Treatise on Impotence, Sterility, and Allied Disorders of the Male Sexual Organs. By Samuel W. Gross, A.M., M.D., LL.D.	392
On Cardio-vascular Vertigo; or Vertigo of Arterio-sclerosis. By Prof. J. Grasset.	395

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

	PAGE		PAGE
Hints on Dietetics	397	Chloral-antipyrine	402
Treatment of Internal Hæmorrhage.	400	Chrysarobin in Psoriasis	403
Case of Severe Acute Anæmia Cured by Salt-water Injections into the Rectum	401	Camphoric Acid in Cystitis and for the Night-sweats of Phthisis	403
Quinine in Typhoid Fever	402	Treatment of Scabies with Creolin	403
Boric Acid in Constipation	402	Hydrate of Amyl in Epilepsy	403
		Hæmorrhoids	404

MEDICINE.

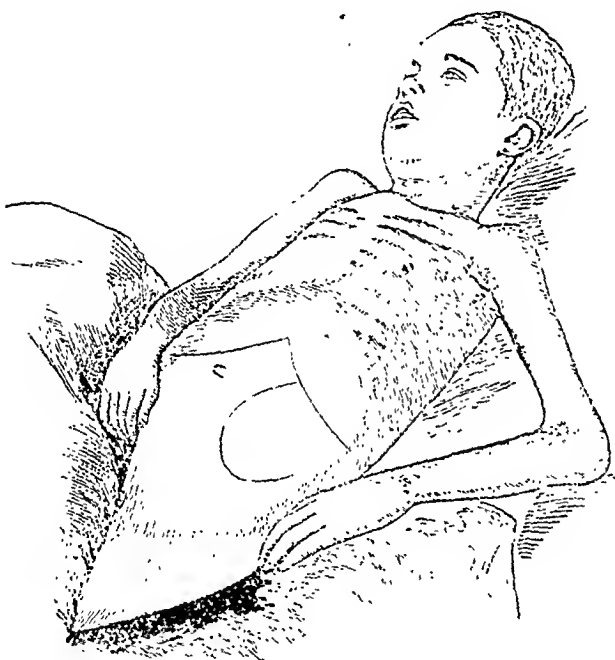
Pathology and Diagnosis of Pediculated and Globular Cardiac Thrombi	405	Bacteriological-chemical Investigations on Tubercle Bacilli	409
Polio-myelitis and Polyneuritis.	405	The Relation Between Pulse-curves and Valvular Lesions	409
Diphtheria	406	Two Unusual Cases of Pneumonia	410
Case of Infectious Adenitis due to the Staphylococcus Pyogenes Aureus	406	The Pulse and the Arterial Tension in Aortic Stenosis	410
Hydatid Cyst of the Liver	407	Ehrlich's Test in Typhoid Fever	411
The Etiology of Tuberculosis	407	Amœba Coli in the Sputum in a Case of Hepatic Abscess	411
Report on the Koch Treatment of Tuberculosis	408		

Lips and gums very pale. Teeth large and good, except molars, which are carious. Tongue pale, flabby, moist, with prominent fungiform papillæ. Tonsils pale, moderately enlarged.

Appetite very poor, and capricious; constant thirst. Frequent discomfort and giddiness after food; occasional vomiting. Bowels regular.

Abdomen: Inspection (Fig. 1): Very full and distended, especially in the hepatic region. Palpation: Soft liver-edge felt distinctly about two and three-quarter inches below costal margin, in right nipple-line. In the left hypochondrium a hard body is felt coming out from below the ribs. It seems continuous with the liver, but its edge is much harder. It reaches one and a half inches below the edge of the ribs, in the left nipple-line. (When the abdominal distention subsided a little, this was found to be the enlarged spleen.) Extending downward from the left hypochondrium, a large, oblong, solid mass is felt: the lower end

FIG. 1.



is rounded and superficial, and extends fully an inch below the anterior superior spine, while the upper end is deeply situated, and cannot be touched by the hand. (It was found afterward that this tumor did not move with respiration; and it turned out, post-mortem, to be the left kidney.) No enlarged glands felt; no ascites. Percussion (Fig. 2): Liver dulness begins above at the upper margin of the fifth rib in the right nipple-line, becomes absolute at the sixth rib, and extends down about seven inches, to two and three-quarter inches below the costal margin.

Lymphatic glands: Almost all those which can be felt are more or less enlarged. They are soft, separate, and painless. Those in the parotid region form a prominent tumor on each side of the face, like half a small Tangerine orange. Several of the submaxillary lymphatic

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APRIL, 1891.

A CASE OF LEUCOCYTHÆMIA IN A CHILD.

BY JOHN THOMSON, M.B., F.R.C.P. ED.,
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AND
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ASSISTANT TO THE PROFESSOR OF PATHOLOGY OF EDINBURGH UNIVERSITY.

G. R., aged seven years and eleven months, brought to the out-patient room of the Sick Children's Hospital, on December 16, 1889.

Complaints: Enlarged glands in neck, susceptibility to catching cold, weakness, lassitude, and pain after eating.

Family history: None of any importance elicited. Father, mother, and five sisters all healthy.

Previous health: Severe eezema soon after birth, which lasted for eighteen months; with this exception, has been tolerably strong and healthy. No infectious disease until eighteen months ago, when he had an attack of diphtheria, lasting six weeks. About a year ago had "bronchitis and inflammation of the lungs," from which he recovered perfectly. For more than six months has had scabies all over the body (practically untreated), which may account to some extent for some of the glandular enlargement. Three months ago seemed quite well, and about that time walked ten miles in one day without being overtired.

Present illness: About two months ago his mother noticed that he was paler than usual, that he had no energy, and that his appetite was poor and capricious; also, that he frequently complained of abdominal pain. He has become steadily weaker since then. One month ago he walked five miles, but was extremely tired after doing so. Three weeks ago the enlarged cervical glands were noticed for the first time, after a bad cold. He has had no hæmorrhages.

EXAMINATION. (December 26, 1889.)—Rather a small boy for his age (weight three stone thirteen and a half pounds), very pale, yellowish, waxy complexion. Marked swelling in front of each ear, and noticeable fulness of lymphatic glands on both sides of the neck and below the lower jaw. Constant short cough. Temperature (axilla) 99.8°.

bad result. Faradism was applied to the abdomen on several occasions. The first few applications were certainly followed by improvement in the general condition, but latterly no effect was produced.

PROGRESS. (A) *The Blood* (by Dr. Muir).—At first (January 3d) the red corpuscles showed comparatively little change in appearance. They varied in size more than usual (6 to 8.5μ), but they formed rouleaux well, and few were of irregular shape. The white corpuscles were seen in great numbers between the rouleaux. They varied greatly in size (6 to 11.5μ), but by far the greater number were 6 to 8μ —i. e. the increase was chiefly of the small variety of leucocyte. They were quite circular, and practically all were finely granular. In stained preparations it was found that nearly all the leucocytes were of the small uninucleated variety, the proportion of multinucleated leucocytes, which in normal conditions are more abundant than the former, being very small. These uninucleated corpuscles varied considerably in size, and the single nucleus generally showed no structure beyond a finely granular appearance, with faint markings, and in some it was slightly indented at one side. Eosinophile cells were seen, but they were very few in number.

The blood-plates were at first of nearly normal number, and of the usual appearance.

In the progress there are to be noted:

(1) A gradual diminution in the number of red corpuscles, which was more rapid as death approached, along with an increased number of irregular corpuscles and greater variations in size. A few nucleated red corpuscles were seen, but only shortly before death.

(2) A gradual increase of the leucocytes, so that their proportion to red corpuscles changed from 1:20 to 1:25. The uninucleated corpuscles varied more in size, large forms becoming more abundant, and the multinucleated leucocytes became proportionately still fewer.

(3) The number of the blood-plates rapidly diminished.

On several occasions, when faradization was applied to the spleen and lymphatic glands, enumerations of the leucocytes were made before and after the application. On one occasion there was a considerable increase in the number of leucocytes in the blood afterward, on another a slight increase, whilst on the other occasions there was practically no alteration. We therefore concluded that the application was followed by no constant change.

Permanent preparations of the blood in such conditions can be rapidly and conveniently made by drying films on cover-glasses, and staining for thirty seconds in a saturated alcoholic solution of methyl-blue. The films are then washed, allowed to dry, and mounted in balsam. The different varieties of leucocytes, and the nucleated red corpuscles, if present, are thus well seen.

(B) *General*.—On the whole the progress was steadily downward, although for a few days after the first application of the faradic current (January 7th) there was considerable subjective improvement. The glandular enlargements varied a good deal, being some weeks much more marked than others. During the last few days of life the glands were noticeably smaller than before (the photograph from which Fig. 1 is copied was taken two days before death). The left kidney also seemed to change considerably in size, becoming, so far as could be felt, about an inch shorter, and then enlarging again. The spleen steadily increased in size, and extended before death at least an inch further down than it did when first seen. The temperature was irregular. During the first

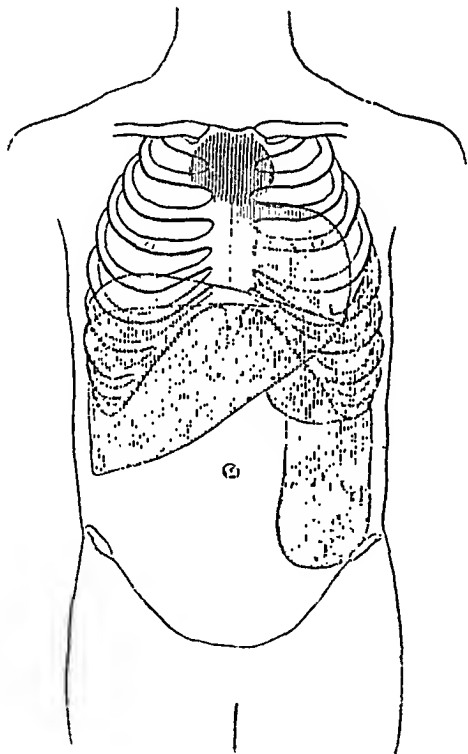
glands on each side are enlarged to the size of a hazel-nut. The sub-occipital, mastoid, supra-hyoid, superior cervical, and both sets of deep cervical glands, are enlarged, varying in size from that of a pea to that of a large bean. Those in both axillæ are large, and the right supra-condyloid is the size of a large pea. There are also numerous large glands in both inguinal regions.

Blood: Hæmocytes, 2,500,000; tolerably normal in appearance. Leucocytes, 125,000; hæmoglobin, 40 per cent. (*v. sub.*)

Heart: No subjective symptoms. Apex-beat in fifth space half an inch outside the left nipple-line. First sound very weak at apex. In pulmonary and auricular areas first sound is replaced by a soft, blowing murmur when the child is sitting up. "Bruit de diable" at root of neck. Pulse 128, weak, but regular.

Thyroid gland not enlarged. *Thymus:* Over the manubrium sterni there is a large patch of dulness, which reaches down below the junction of the second costal cartilages, and for more than an inch on each side. (Fig. 2.)

FIG. 2.



Lungs: A few rhonchi at bases; otherwise normal. Urine pale acid, low specific gravity, no albumin, no sugar.

Fundus oculi: Arteries small and pale, veins large and flat, no hæmorrhage, discs normal.

THE TREATMENT aimed at was the administration of arsenic, in as large doses as possible. Fowler's solution was given in doses of from m_j to m_v , but had always to be stopped after a few days, owing to the repugnance to food, vomiting, and diarrhœa, which it invariably produced. Iron (*ferrum redactum*) was also tried repeatedly with similar

bodies not prominent; trabecular tissue apparently not increased. No infarcts.

The left kidney is seen at once on opening the abdomen, as a large oblong body, occupying the left lumbar and upper iliac regions, and displacing the spleen upward. It is crossed about the middle by the descending colon. On removal it is found to weigh $16\frac{1}{2}$ ounces, and to measure 7 by $3\frac{1}{2}$ by $2\frac{1}{2}$ inches. The capsule is somewhat adherent, the surface extremely pale, mottled, and yellowish. On section the medulla is of a pale reddish cream-color. The cortex is comparatively enlarged, pale yellow in color, and presents numerous little bright-red spots with pale yellowish centres. There are also a number of narrow red streaks between the tubules in the cortex and in the pyramids. There is one small cyst, about the size of a pea, near the lower end of the organ, and at the surface, near its upper end, there is a hard yellow nodule, evidently an old infarction.

The right kidney is not seen until the intestines are removed. It is, however, about the same size as the left one ($6\frac{1}{2}$ by $3\frac{1}{2}$ by $2\frac{3}{4}$ inches), though situated higher up, and it weighs exactly the same, and in appearance, externally and on section, it is very similar. It contains a cyst the size of a small bean, and an old infarction, like that in the other organ.

The intestine seems normal (it was not fully examined). The mesenteric glands vary from the size of a hempseed to that of half a walnut. They are extremely soft. On section, some are of a pale cream-color, and others yellowish-red from hæmorrhage.

The testicles are not enlarged, and seem normal.

Thorax: On laying bare the ribs, a few small, bright-red subperiosteal hæmorrhages are seen just outside the costo-chondroid articulations on some of them. When the thorax is opened, the upper half of the mediastinum is found to be occupied by a somewhat quadrilateral yellowish white mass, of a hard, almost fibrous consistence. It measures $3\frac{1}{2}$ inches from above downward, 2 to $2\frac{1}{2}$ from side to side, and about 2 antero-posteriorly. On the anterior surface there are several punctiform hæmorrhages. Anteriorly, the upper half of this mass is adherent to the back of the manubrium sterni. Posteriorly, it lies on the aorta and other great vessels, displacing them backward. Above, it tapers off to a point about the level of the top of the sternum. Below and behind it is closely adherent to the pericardium. From the position occupied by this tumor, it seems probable that it is connected with the remains of the thymus.

The pleuræ, both costal and pulmonary, present numerous small hæmorrhages, but seem otherwise normal. No adhesions, no effusion.

The left lung is of a pale color, and on section has a peculiar mottled appearance, due to the occurrence of yellowish-red consolidated patches, about half an inch in diameter (hæmorrhages), which are scattered here and there—there being more in the lower than in the upper lobe.

The right lung has a precisely similar appearance.

The glands at the root of the lung are enlarged, some to the size of a hazelnut. On section some are dark-red, from hæmorrhages into their substance.

The pericardium contains about two ounces of reddish milky serum. There are numerous subserous hæmorrhages into both its layers. It is otherwise normal.

fortnight of treatment it was nearly normal in the morning, and from 101.5° to 103° in the evening. Later on, it was frequently subnormal early in the day, and usually from 99° to 101° in the evening. Several hæmorrhages occurred. On December 27th there was severe epistaxis, and on February 2d a slighter attack of a similar nature. On February 3d there was oozing from the gums. Two days before death numerous hæmorrhages were found in both retinæ, along with optic neuritis in the right eye. On December 29th a patch of dulness and crepitation was discovered in the right scapular region, but, with this exception, there were no objective lung-signs. During the last weeks there was considerable distress caused by nasal obstruction, which became almost complete. The tonsils also enlarged somewhat, but not very greatly. The urine continued free from albumin, but, toward the end, contained large quantities of colorless elliptical uric-acid crystals.

On the morning of February 13th the patient became suddenly extremely breathless, although air was freely entering all parts of the lungs. He died in the afternoon of the same day.

ENUMERATION OF BLOOD-CORPUSCLES.

Date.	Hæmocyles.	Leucocytes.	Blood-plates.	Proportion of white to red corpuscles.
December 26th	2,500,000	125,000	. . .	1 : 20
“ 30th	2,560,000	93,000	194,000	1 : 26.5
January 3d	2,245,000	112,000	252,000	1 : 20
“ 7th	2,260,000	229,000	230,000	1 : 9.8
“ 12th	2,145,000	241,000	224,000	1 : 8.8
“ 14th	2,170,000	226,000	222,000	1 : 9.6
“ 17th	2,085,000	209,000	102,000	1 : 9.9
“ 23d	2,031,000	219,000	. . .	1 : 9.2
“ 27th	1,992,000	247,000	72,000	1 : 8
“ 30th	1,686,360	214,000	19,000	1 : 7.8
February 3d	1,181,250	222,000	7,300	1
“ 6th	1,150,000	312,000	10,000	1 : 3.3
“ 9th	902,500	379,000	13,000	1 :
“ 12th.	721,250	283,000	7,000	1 : 2.5

POST-MORTEM EXAMINATION (twenty-two hours after death).—*Abdomen*: The liver is much enlarged, pale in color, flabby in consistence, apparently fatty on section. There are several minute subserous hæmorrhages in its peritoneal covering. The gall-bladder is moderately distended with pale-green bile. The spleen is much smaller than it was during life, its anterior extremity only reaching forward as far as the anterior axillary line, and its lower border being one inch below the costal margin in the mid-axillary line. Weight, 11 ounces. Size, 6 by 4 by $1\frac{1}{2}$ inches. Capsule smooth, no hæmorrhages. Not very pale in color, consistence rather soft. On section, surface pretty uniform, rather pale; Malpighian

cytes and a hyaline material. There was no fatty change in the lymphatic glands or in the spleen.

The mass in the upper mediastinum was much more fibrous than the lymphatic glands. It had a stroma of dense bands of fibrous tissue which carried the bloodvessels. These broke up into small bands, between which were spaces filled with lymphoid tissue, in which were many capillaries. There was nothing seen by which it could be identified definitely as the thymus.

The enlargement of the kidneys was seen to be due to an infiltration of its connective tissue with small lymph-corpuscles. This infiltration was pretty uniform in the cortex, where it separated widely the tubules and Malpighian bodies. In the boundary area and in part of the medulla it was arranged in cord-like masses which ran along the vessels, the tubules being found running in the spaces between. Toward the apices of the pyramids there was no infiltration between the tubules. There was considerable fatty change in this lymphoid tissue. The epithelium of convoluted tubules was at places detached and granular, but showed no signs of proliferation, and the change was rather degenerative than inflammatory. The glomeruli were practically normal, and contained comparatively few of the small round cells. There were hæmorrhages scattered in the cortex of the kidneys, and in one place was an old infarct which was encapsuled in fibrous tissue, and in which could be seen the necrosed tubules separated by degenerated lymphoid corpuscles. This showed that the infiltration of the connective tissue must have lasted for a considerable time.

In the liver there was a somewhat similar leucocytic infiltration extending along the portal spaces, and pushing out between the liver cells. There was fatty degeneration of the cells, chiefly around the central vein of the lobule. Some of the liver cells contained yellowish pigment, which did not blacken with sulphide of ammonium.

The muscular fibres of the heart showed extensive fatty degeneration, and the connective tissue under the endocardium was infiltrated with small lymphoid corpuscles. The clot in the heart was composed of numerous uninucleated leucocytes closely arranged, between which were delicate fibrin filaments.

In the lungs many of the smaller vessels were filled with leucocyte thrombi, and the neighborhood of such vessels was often the seat of hæmorrhage. Where hæmorrhage had occurred most of the air-cells were filled with red corpuscles, with leucocytes intermixed, but some were packed almost entirely with leucocytes. This arrangement was probably brought about by the influence of gravity on the corpuscles in the effused blood, or it might have been due to the giving way of vessels which were plugged with leucocytes, these being poured out into the nearest air-cells. The parts of the lung free from hæmorrhage showed dilatation of the alveolar capillaries, which contained many leucocytes, and, in some of the air-spaces numerous round catarrhal cells, many of which contained granules of brownish pigment. The peri-bronchial connective tissue and many of the septa were densely infiltrated with small leucocytes, and the infiltration could be traced along the bronchi to the glands at the root of the lung which were affected like the other glands. Some parts of the pleura were infiltrated in the same way, some were quite free. No part of the lung showed fatty change.

I also examined a specimen of ordinary connective tissue (taken from

The heart is very pale. All its cavities contain a large quantity of pale, almost cream-colored, soft clot. In the right auricle and left ventricle there is also a little black clot. The muscoli papillares of the mitral valve show the peculiar striated appearance of fatty degeneration most typically.

The lymphatic glands in the groin and elsewhere present the same characters as those in the abdomen and thorax.

REMARKS.—The main points of clinical interest in the case may be briefly recapitulated:

(1) The rapid course (less than five months) which is characteristic of the disease in early life.

(2) The powerlessness of treatment, which may partially be attributed to the late stage at which the child was first seen, and to the extremely irritable condition of his alimentary tract, which prevented the satisfactory administration of remedies.

(3) The mediastinal tumor, which from its relations may be almost certainly held to have arisen in the remains of the thymus gland, and which is uncommon, although several instances of a similar condition have been published.

(4) The great enlargement of both kidneys, and the fact of the left one forming, during life, such a prominent abdominal tumor.

Abstract of Microscopic Examination, and Remarks. (By Dr. Muir.)

The bone-marrow was of a pale-pink color, but had not that pus-like appearance which has been described in certain cases of leucocythæmia. On microscopic examination, in a 0.6 per cent. solution of sodium chloride, tinted with methyl-violet, it was found that most of the cells were colorless, uninucleated corpuscles of various sizes (6–10 μ) similar to those in the blood. The proper marrow-cells, nucleated red corpuscles, and ordinary red corpuscles were comparatively few in number. The chief change appeared to be a great increase of small uninucleated corpuscles at the expense of the cell elements more strictly belonging to the marrow. In the spleen and lymphatic glands the same cells were seen in great numbers; in the former some were of larger size than in the latter.

In sections of the spleen it was seen that the great increase in size was due to an increase of the cellular elements of the pulp. The Malpighian bodies were small and ill-defined, the trabeculae were relatively small, and the reticulum of the pulp was scarcely thickened. The cells in the splenic pulp were uninucleated corpuscles of varying size, but most were small. There were no eosinophile cells. Red blood-corpuscles were few in number.

The enlargement of the lymphatic glands also was due to a great increase of the lymphoid corpuscles, and not to any fibrous overgrowth. The corpuscles were most closely packed in the cortex, being in some places very densely aggregated in the lymph-sinus under the capsule. In the medullary portion the tissue was more open, and very vascular. There were no thrombi in the small vessels, but in the chief artery of one of the glands a thrombus was seen composed of mixed layers of leuco-

forming area in the bone-marrow by these leucocytes, with consequent diminution of the nucleated red corpuseles, etc., rather than to a failure of transformation of leucocytes into red corpuseles; it being now generally held (and my own observations support the view), that the leucocytes in the blood do not become red corpuseles.

A CASE OF SUCCESSFUL REMOVAL OF A RETRO-PERITONEAL FATTY TUMOR.¹

IN THE COURSE OF THE OPERATION A VEIN, SUPPOSED TO BE THE LEFT COMMON ILIAC, TORN AND TIED.

BY JOHN HOMANS, M.D.,

SURGEON TO THE MASSACHUSETTS GENERAL HOSPITAL, AND HARVARD UNIVERSITY LECTURER ON OVARIAN TUMORS.

It has been my fortune to meet with several large fatty tumors in the abdomen and on the thigh. Three of those in the abdomen weighed over fifty pounds, and two in the thigh weighed over ten pounds each, and extended from Poupart's ligament to the patella.

The case which I report is interesting, as being the only one of its kind which has been successfully removed by laparotomy, or perhaps I ought to say that I can find none reported.

The patient was a woman, fifty-four years old; married. She was the mother of five children, the youngest being thirteen years old. On the day I first saw her she was, in general appearance, rather pale and anxious-looking; there was no œdema, and but slight emaciation. On examination, the abdomen was found uniformly distended, and enlarged to the size of a five months' pregnancy. There was a rounded, smooth, rather hard, non-fluctuating tumor filling the pelvis and rising nearly to the umbilicus. The abdomen was tympanitic, except just below the umbilicus over an area the size of the palm of the hand. On deep pressure a larger area of dulness was found. Both flanks were tympanitic. On auscultation, no aortic sound nor impulse was heard. There was slight tenderness in the left flank. The parietes were moderately thick. The tumor was very slightly movable. The girth at the umbilical level was thirty-one and a half inches. The uterus was pressed downward and backward, and could not be decidedly separated from the tumor. Bimanually the tumor was found to be slightly movable, non-fluctuating, and rather flabby-feeling. The urine had a specific gravity of 1009, and contained a large trace of albumin and numerous hyaline and granular casts, pus, and renal epithelial cells.

Since the change of life, twelve years before, at the age of forty-two, she had been troubled by frequent vomiting, usually in the morning; and for the past three weeks it had been almost incessant. It was for

¹ Read before the Boston Society for Medical Improvement.

the neighborhood of the aorta), and found an abnormally large number of lymphoid corpuscles in its lymphatic spaces.

REMARKS.—Of the various pathological changes found, some are evidently secondary in character. Such are: the fatty degeneration in several situations, but most marked in the muscular fibres of the heart, the hæmorrhages in the kidneys, lungs, etc., the clotting within the heart, and the plugging of the pulmonary vessels with leucocyte-thrombi. The essential change is the presence of an enormous number of uninucleated leucocytes in all situations where these are normally present. These situations are—(1) in the blood, (2) in the spleen, bone-marrow, and lymphatic glands, (3) in the lymph-spaces of the connective tissue in various organs and parts of the body, *e. g.*, the connective tissue of the kidney (where the phenomenon is most marked), the portal tracts in the liver, the peri-bronchial and subpleural connective tissue in the lung, the subendocardial connective tissue in the heart, and, as an example of ordinary fibrous tissue, the connective tissue along the aorta. Such a condition can only be explained, I think, by an active proliferation of these uninucleated corpuscles. The cells found in the tissues have most probably passed out of the bloodvessels, as they are most numerous around these, though they may proliferate after doing so. The lymphatic glands are, I think, infected secondarily from the tissues, through the afferent lymphatics, and accordingly we find the corpuscles most closely packed in the cortical lymph-sinuses. In fact, given the condition of the tissues as found in this case, we could almost predict such an affection of the glands. I have also seen a case in which the change in the blood was of the same nature as in the present case, though less advanced, whilst the lymphatic glands were not affected, or only very slightly. Hence, though in cases of leucocythæmia in which the glands are affected, the leucocytes, as a rule, are mostly of the small uninucleated variety, the change in the glands is most probably not the cause of the leucocythæmia, but the effect of it. It is difficult to determine the exact starting-point of the proliferation, nor is it so important as the determination of its cause. I have been unable to find micro-organisms in this case, though Fermi¹ has cultivated a bacillus from a spleen in leucocythæmia, and Kelsch and Vaillard² have found a similar organism in the blood and in leucocytic deposits, and have made cultivations of it. In both instances the lymphatic glands were affected. The theory that a microorganism is the cause of the proliferation of the leucocytes would be in accordance with the facts, and would be rather favored by the course of the temperature in this case.

The anæmia I consider to be due to the occupation of the blood-

¹ Fermi, *Centralb. f. Bakt. u. Parasit.*, vol. viii., November 18, 1890.

² Kelsch and Vaillard, *Annales de l'Institut. Pasteur*, 1890, p. 276.

after tapping a patient (for the fifty-second time, I may add) who was suddenly seized with a violent cough, with the result that the abdomen was protruded in a most marked manner: a process which was repeated, (although with much more prominence of the recti) when he attempted to raise himself from the reclining to the sitting posture.

An exactly similar condition was again demonstrated to me by a patient who suffered from severe vomiting immediately after the removal of a large ovarian tumor.

Having these cases on my mind when I saw patient No. III., I determined to try the result of an electric current through the muscles of her abdomen, when they were flaccid during anæsthesia.

The result passed expectation—a faradic current through the abdominal muscles causing the most marked prominence of the abdomen in a manner quite analogous to her condition before anæsthesia.

A similar purely muscular distention of the abdomen I have frequently felt during and after the third stage of labor, which rendered a grasp of the uterus most difficult to obtain.

As a result of this distention of the abdomen the intra-abdominal pressure will naturally be much diminished, and thus allow of much flatulent distention of the intestines—a condition which, being naturally generally associated with the prominent abdomen, has been frequently looked upon as the cause instead of the effect.

Such, then, being an explanation of the factors in this strange process, one naturally looks for an explanation of the prime cause—a much more difficult question.

On looking over the published cases it will be noticed that the great majority of examples have been furnished by women at the menopause, while the others have been associated with disease of the generative organs or vitiated mental conditions. We must, therefore, consider our essential cause primarily as purely nervous, but we can go still further, and subdivide it into two varieties, mental and reflex. The former is generally exemplified by the wish being father to the thought—women at the change of life clinging closely to the cherished ideal of their sex, and relinquishing it with reluctance. But again, it is occasionally due to fear, the result of some illicit intimacy, as is well exemplified by a case described by Gooch.¹

That it is frequently, however, quite independent of purely mental origin, Cases II. and III. give excellent proof. Neither were desirous of having children; one had already had twelve and was barely able to support them, while the other personally told me she would rather not be pregnant, and seemed grateful at my supposed clandestine removal of the offending member. Both suffered from distinct pathological

¹ Gooch's Diseases of Females, p. 226.

the relief of this symptom that she entered the Massachusetts General Hospital. Her father and one sister had died of phthisis. About a year before her entrance she had noticed a "lump" in the lower part of her abdomen, about the size of an egg, and had not noticed any special change in its size since; she had been losing flesh and strength during the past five months. My diagnosis was uncertain. I did not think the tumor ovarian, and probably not a fibroid of the uterus, and I said frankly that I could not make an exact diagnosis, but that I thought it my duty to open the abdomen and see what the tumor was. If the renal symptoms and the vomiting were caused by the pressure of the tumor, they could be relieved by its removal; if they were caused by chronic interstitial nephritis, then the woman would prove a poor subject for a surgical operation, and the result would, perhaps, be fatal.

On March 18th, 1889, I opened the abdomen by an incision about five inches long. I found the tumor to be covered by two layers of peritoneum, and encapsulated. I divided both layers of peritoneum and put a corkscrew into the tumor, but it tore its way out, and the fragments coming with it were seen to be fat tissue. The capsule was then split open and the tumor shelled out comparatively easily; smaller lobules or tumors were then seen between the spine and sacrum and peritoneum, extending down into the pelvis. Several of these smaller tumors were shelled out of their capsules and attachments with considerable difficulty. In separating them, a vein on the left brim of the pelvis, the size of an ordinary little finger, and which I took at the time to be the left common iliac, but which may have been the internal iliac, was slightly torn, and bled very freely. I seized the vein in pressure forceps and tied it with silk above and below the hole—several other bleeding points were tied with catgut. Other small lobules were seen, which apparently ran down to the right buttock. The abdominal cavity was sponged out, and the wound closed without drainage. The uterus and its appendages were apparently normal. The intestines were not seen. The estimated weight of the whole mass was about five pounds. Dr. W. F. Whitney, Curator of the Warren Museum, reported that the growth was composed entirely of fat tissue. She had one-fifth of a grain of morphia five hours after the operation; she vomited once on the 18th and once on the 19th of March, and never afterward. The temperature never rose above 100°; her left leg did not swell, nor was the circulation in it ever been impaired. I hunted her up and found her in her lodgings, doing all her own work, on December 8, 1889, more than six months after the operation. She had never vomited after her return home, and was robust and strong. I obtained a specimen of the urine, and found it to be still slightly albuminous. On October 15, 1890, I received a note saying that her health was fairly good, except for symptoms which might be attributed to the renal disease.

I have purposely refrained from reporting this case earlier so that I might learn if the cure was permanent. So it is, as far as the tumor is concerned and the relief to the vomiting, but, of course, the renal troubles may increase at any time. Most of these large, fatty tumors are myxo-lipomas, as was the case in the two that I removed some years ago, and reported in the *London Lancet*. It is, however, the position of these tumors, and not their structure, that makes them difficult of

admitted that few subjects could be of more interest, not only to the aurist, but to the general practitioner as well.

Simple acute Eustachian salpingitis is a frequent sequel of acute nasopharyngitis of various types, notably of true acute coryza and the several phases of acute rhinitis associated with scarlet fever, measles, etc. It may exist as an active hyperæmia only, or may go on to deep-seated infiltration and serious inflammation. The phenomena are those of inflammation of any mucous membrane; there is swelling of the mucosa and increased secretion, the exudate containing numerous ciliated epithelial cells. The mucus may be so thick and adhesive as to project from the pharyngeal orifice as a bulla, the masses being of jelly-like consistency and often of considerable size. The gland follicles are also engorged and enlarged, giving a granular appearance to the tubal lips.

The symptoms of acute tubal catarrh are pain, either of an indefinite, dull, heavy character or, in severe cases, the characteristic *boring* pain of "earache," autophony, deafness, and tinnitus aurium. Examination with the rhinoscope shows engorgement, sometimes closure of the Eustachian opening, and in the later stages of severe cases the mucous exudate above described. The nasal mucous membrane shows the "wet-brick" congestion of acute rhinitis, with the usual swelling and occlusion, rapidly disappearing under applications of cocaine. The pharynx shows engorgement of the tonsillar regions in most cases. Inspection of the membrana tympani may or may not demonstrate retraction, with more or less injection of the manubrial plexus of bloodvessels.

The prognosis is complete return to normality under proper treatment, but if the disease is left to run its course some permanent impairment of hearing almost certainly results.

*True croupous inflammation*¹ of the tube occurs as a complication of pharyngeal diphtheria, usually in fatal cases, the symptoms being those of simple inflammation much exaggerated.

Chronic Eustachian salpingitis is the most common ear disease occurring in the eastern United States, from one-half to three-fourths of the aural cases applying at our clinics, or for private treatment, being sufferers from some stage of this affection. The pathological lesions are persistent hyperæmia and infiltration, with enlargement of the glands and thickening of the sub-mucous connective tissue, from fibro-blastic organization of leucocytes. This may be so extensive that the hypertrophied mucous membrane is thrown into folds and wrinkles at the Eustachian orifice—a most important fact to remember when using the Eustachian catheter in these cases.

The symptoms of this condition are progressive deafness, distressing tinnitus aurium, occasional autophony when the tubes contain mucus,

¹ Wendt: Archiv. der Heilkunde, xi. S. 261.

states of the uterus, and I think we may legitimately infer that the abnormal condition was entirely of a reflex nature—an origin leaving little to imagination, when one considers the intimate nervous relations which exist between the uterus and abdominal muscles in the lumbar plexus.

To account for the cause of the other signs of pregnancy in any more lucid manner than by generally attributing them to nervous influences is hopeless; details are a mystery. But if, as is well known, sudden nervous impressions are sufficient to inhibit the secretion of milk, there seems no reason why other nervous impressions may not react in an opposite manner.

An example in the lower animals under my own observation illustrates, in a marked manner, the influence of will in promoting the lacteal secretion. A Dandie Dinmont bitch has had pups three times, the last litter five years ago; since that time, however, she has successfully nursed three litters of Highland terrier puppies, which she appropriated at the earliest opportunity after severe conflicts with the real mother, a weaker dog. Other cases such as this have been recorded by Harvey.¹

The subject as a whole, though highly interesting and curious from a scientific point of view, demands from a practical standpoint special attention.

No more damaging error of diagnosis can be made than that regarding pregnancy, and none more certain to be revealed, and I might almost say, proclaimed from the housetops. Therefore these cases, though scant, must be of value in teaching how necessary it is to refrain from assenting to a diagnosis of pregnancy, without having satisfied ourselves of at least one *absolute* sign.

THE TREATMENT OF INFLAMMATION OF THE EUSTACHIAN TUBES.

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THE great clinical importance of the inflammatory diseases of the Eustachian tube may, perhaps, be best summarized by stating that all ear diseases, not dependent on causes acting from without through the external auditory canal, are dependent on Eustachian lesions. When the enormous frequency of middle-ear affections is considered, it will be

¹ Generation of Animals, p. 540.

The prognosis of simple chronic Eustachian inflammation under careful management is excellent, great relief and occasionally cure resulting. In true aural sclerosis, however, the outlook is extremely grave; without treatment or climatic change, total loss of hearing seems the only alternative; and misdirected therapeutics, and preëminently meddlesome operative surgery, assures speedy and hopeless deafness. Fortunately, however, by the use of proper means, if the patient can be controlled, the disease can be arrested in most cases, and in some instances a slight degree of improvement secured.

A third type of Eustachian disease deserves special consideration. *Septic* tubal inflammation, the Eustachian lesion of purulent otitis, precedes and accompanies all cases of middle-ear suppuration, and may be found in examples of purulent rhinitis where the tympanum has as yet escaped infection. The cause is the entrance of pathogenic bacteria or their ptomaines into the ear-tube; it occurs, therefore, with all types of septic naso-pharyngitis, preëminently in scarlatina, typhoid, diphtheria, and measles.

The symptoms are usually marked and distressing, being those of simple acute inflammation much exaggerated; if the tympanum is invaded, agonizing pain, delirium, and even coma may ensue, the temperature frequently reaching 105°. On examination the post-nasal mucous membrane will be found intensely gorged, œdematous, and dark-purple in color; erosions extending to shallow ulcers, from the death and shedding of epithelia, are also characteristic lesions. The tubal opening is usually not visible, and patches of semi-adherent pus stick to the Eustachian prominences and the general mucous membrane. I have frequently seen glairy muco-pus oozing from the tube in an adherent string, illustrating the bad surgery of using Politzer's inflation—as usually employed—in these cases. Inspection by the external canal may show any phase of destructive otitis, and perforations of the drum are the rule.

The affection is always a serious one, always threatening both hearing and life; the first by invasion of the tympanum, the second by extension to the mastoid cells and the meninges. General septicæmia, with its dangers, is also far more common in cases of purulent otitis, the writer believes, than is taught in most otological works.

The treatment of Eustachian salpingitis varies widely, according to the variety and the stage of the disease. The simple acute type reacts exceedingly well to properly directed therapeutics. The indications are: first to control the coryza by means of cocaine muriate, delicate antiseptic and sedative spray applications, and the use of a sedative powder, containing bismuth, morphine, and atropine; or, as I frequently employ, a spray application of menthol, camphor, and eucalyptol, in minute proportions, dissolved in *albolene*, or a similar bland oil. In severe cases

and, under the same conditions, squashing and bubbling sounds in the ear. Although noted in few if any text-books, dull pain, throbbing, and a sense of tension and distention in the ear are among the first and commonest symptoms of this disease. Vertigo, headache and neuralgia are frequent, and phenomena caused by the naso-pharyngitis are prominent. By the rhinoscopic mirror the tubal prominences are found to be swollen, dark-red in color, and the openings are often occluded by tenacious mucus or hypertrophied mucous membrane. Large, prominent veins, similar to those so frequently seen on the pharyngeal wall and epiglottis in long-standing pharyngo-laryngitis, traverse the tubal lips. The nares show advanced rhinitis, and the pharynx gross nodular changes bearing a direct causal relation to the nasal and aural lesions, as I have previously shown.¹ Examination with the ear speculum and mirror (always far less instructive than inspection of the Eustachian region) shows varying degrees of opacity and retraction of the drum, very frequently associated with vasomotor disturbances of the lining of the external canal, cerumen impactions, eczema, etc.

In patients in whom the catarrhal diathesis is prominently present, usually as an inherited condition, chronic Eustachian salpingitis tends inevitably to progress into true aural sclerosis. The causes are a condition of bloodvessel malnutrition, occasionally associated with gout, syphilis, or tuberculosis, but far oftener seeming to depend on the action of some constitutional poison, as diphtheria, or on some obscure central vasomotor influence.

The symptoms, when advanced cirrhotic changes have occurred, are not obstructive; frequently, on the contrary, the Eustachian channels are widely patulous. Progressive deafness, severe tinnitus, and, as in cirrhosis of other organs—the kidney, etc.—a proneness to acute exacerbations, are characteristic symptoms. The tubal prominences are atrophied, shrunken, yellowish-gray in color, their openings plainly visible; and the use of the Eustachian catheter demonstrates the tube to be too freely open throughout its length. The general post-nasal mucous membrane is papillomatous,² fibrous, and anæmic; secretion is usually scanty, with an inclination to form thin, scaly crusts. The respiratory mucous membrane, from the anterior nares to the capillary bronchi, shows inflammation and induration, and the skin, digestive tract, and heart demonstrate the “catarrhal diathesis.”

The tympanic membranes show thickening, retraction to “jamming,” adhesions, and newly-formed fibrous tissue bands, the function of the drum being often completely destroyed; the tubal muscles also undergo fatty degeneration and atrophy, so complicating and adding to the vicious circle of pathological processes.

¹ The Medical News, October 22, 1887.

² See THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES, February, 1889.

and other of the well-known therapeutic methods must be directed to the tympanic membrane and chain of ossicles to secure improvement in hearing. Internally and constitutionally the bloodvessel tonics are of the first importance, and careful regulation of the habits of life is essential.

In cases of true sclerosis, applications of stimulants to the naso-pharynx and Eustachian passages are of far more value than is generally supposed; galanga, iodine, eucalyptus, thymol, and myrrh, are valuable in the order named, and the approved treatment of sclerotic rhinitis and pharyngitis must be carried out in fullest detail. Constitutional remedies are to be directed to the diathesis, and a large share of fresh air and exercise, accurately regulated, must, if possible, be secured. The methods advocated in earlier stages of the disease should be carefully carried out, often over periods of a year or more, and the patient must remain under permanent supervision.

The procedures through the outer canal, at the command of modern aurists, are almost too numerous to mention; but very many highly-lauded operations are, in the writer's opinion, not of permanent benefit, but of inevitable injury. An invariable rule should be that no fresh migration of leucocytes should be caused—their tendency to form fresh connective tissue being the pathological essential of the disease. The *rationale* of scientific treatment is to so "stimulate" the blood and nerve-supply as to prevent the hyperplasia and contraction of connective tissue elements, and to control inflammation and the migration of fibro-blasts.

Two operations are at the present time very fashionable in aural sclerosis: *mobilization of the stapes*, lately brought forward as new,¹ but frequently performed, lectured upon, and reported² by me more than three years ago under the name of *drum-stretching*, and considered on theoretical and anatomical grounds years before by Kessel and Politzer, is perhaps the most valuable practical operation in these cases. But its effects last but a few months at most, and it cannot yet be decided whether, from its frequent repetition, the patient receives permanent benefit or the reverse. Done with extreme care there is no inflammatory reaction, and but trifling risk; the operation consists in making a free incision in the posterior segment of the drum; a hoe-like instrument of great delicacy is then introduced through the cut, and cautious traction made on the handle of the malleus, or the incudo-stapedial joint, or both, so "stretching" and possibly breaking up adhesions. In nearly all cases there is at least temporary improvement in hearing, and—as is the case with almost every operation upon the ear (as upon epileptics) temporary "cure" of the tinnitus aurium.

The second fashionable operation, recently brought into much promi-

¹ Annales des Maladies de l'Oreille, November, 1889.

² The Polyclinic, September, 1887, p. 89.

where discomfort is great, atropine and sodium bromide, given by the mouth, seem to exert a strong controlling influence. The pharynx should receive soothing treatment, and laryngeal or bronchial complications careful attention. Symptoms referable to the middle ear, unless pain is a prominent feature, are far less important, as they will disappear as soon as the salpingitis is controlled, and all meddlesome surgery directed to the drum membrane through the auditory canal is so unscientific and useless as, perhaps, to deserve the name of an anachronism—belonging as such procedures do to the dark ages of otology. Politzer's or catheter inflation may be called for in the later stages of the disease, and direct tubal applications by means of the *syringe-catheter* are indicated, should hyperæmia and hypersecretion persist.

If the inflammatory process tends to continue and become subacute in character, sprays of the distillate of hamamelis, properly diluted, or of the sulpho-carbolate or iodide of zinc, used preferably in the post-nasal atomizer, act very well. Patients can usually be dismissed cured in from one week to one month of treatment.

Croupous inflammation of the tubes and naso-pharynx demands the approved antiseptic treatment of diphtheria, but when the disease is so extensive is seldom successful; the urgency of the laryngeal and constitutional symptoms generally far outweighing and masking the aural sequelæ.

Chronic Eustachian catarrh was, up to a very recent date, one of the opprobria of the profession; the prognosis under the dallying, unscientific treatment in vogue a few years ago, as to relief, being *nil*. But at the present time, improvement can be promised to all but aged or hopelessly delicate patients, and a cure can be obtained in most early cases. The naso-laryngeal tract must first be brought as near a condition of normality as its lesions and the state of our knowledge permit. Especially must all nasal obstructions be removed, the great danger of even a moderate degree of stenosis having been incontrovertibly proved by Pomeroy¹ and others. Usually this can be accomplished by the use of well-chosen sprays, of chromic acid used by Bosworth's method, or by the very cautious and conservative employment of the galvano-cautery; in very rare cases only the septal knife, saw, or gouge, and the nasal snare may be needed. But (*physiologically*) free respiration through both nostrils is absolutely essential to permanent improvement.

The faradic current applied directly to the turbinated bodies, the Eustachian prominences and the pharynx, by means of the nasal electrode, and applications to the tubal lining by means of the syringe or ordinary catheter (only the mildest solutions in bland oil being admissible in the latter instance) are of great value. Of course, inflation, drum massage,

¹ The Medical Record, February 18, 1888.

the stylo-mastoid artery—which supplies the tympanum, mastoid cells, and semi-circular canals—that the method acts favorably. It is also well known that surface freezing lessens the conductivity of nerves, and profoundly affects nerve centres.¹

The therapeutic management of purulent Eustachian salpingitis does not differ widely from that proper in cases of simple acute catarrhal inflammation, but the spray selected should be decidedly antiseptic, as well as sedative, in character, and the drum and middle ear demand the most thorough attention and treatment. Inflation should not be used unless the lower portion of the tube can be first cleared, and injections of fluids into the tympanum through the Eustachian passages have been found to be rarely valuable. Tonics are always called for, and complications will need special attention. Thorough treatment of the naso-larynx, antiseptic irrigation through the external canal, and the proper use of boric-acid powders, will cure all cases where neither a profound cachexia nor dead bone exists, the latter being causative of the luxuriant growth of granulation tissue so troublesome in many cases of this type.

In conclusion, it has been the experience of all aurists that in no region of the body are meddlesome therapeutics so ill borne as by the Eustachian tubes, and all methods must be carried out with the most cautious, painstaking conservatism, to insure good results, in all phases of Eustachian salpingitis.

49 N. SEVENTEENTH STREET.

HÆMO-HYDRO-NEPHROSIS, DUE TO A SLIGHT INJURY; DRAINAGE; RECOVERY.

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R. W., aged fifty-four, came under my care at the General Hospital, April 27, 1889, with a large tumor occupying the front of the abdomen, on the right side. It extended upward nearly to the costal arch, downward to the brim of the pelvis, and nearly to the middle line, but did not present at all distinctly in the lumbar region. Palpation gave the impression of a very tense cyst; there was no resonance over the front of it, such as usually exists in renal tumors. The skin and subcutaneous tissues moved freely over the tumor, but the muscles were tightly stretched over it, giving the impression that the swelling might be intra-muscular. His *history* was as follows: About two years before admission the patient's wife, when getting into bed, slipped, and knelt on his right side with some force, causing very severe pain for a short time. Six months ago he noticed a swelling on this situation as large

¹ See Dr. S. Weir Mitchell, in *Medical News*, September 3, 1887.

nence, but not new, is *excision of the drum-head* with the malleus and [occasionally] the incus; the procedure is naturally a far grosser one than stretching, and exceedingly liable to be followed by reactive inflammation. This operation, possibly of great value in purulent attic disease with necrosis of the ossicles, the writer cannot consider rational in cases of aural sclerosis, for the following reasons:

1. The operation always causes fresh migration of small cells, whose persistent tendency is to organization with subsequent contraction, equalling increase in deafness.

2. The method (in many cases) permanently robs the delicate tympanum of its protective covering, the drum, and all aurists are aware that the results of a persistent perforation are eirrhosis and impairment of audition: the primary physiological purpose of the membrana tympani being protective, any permanent opening is harmful to the ultimate condition of the organ. As so ably shown by Richey, of Washington,¹ "The tendency of the membrane to heal is an effort on the part of Nature to preserve the function of hearing from the effects of disease, or ill-advised surgical interference."

3. The manipulation is always painful, requiring general anæsthesia, and always has an element of danger—actually resulting in not a few instances—viz., acute purulent otitis, with its perils to hearing.

To summarize briefly, it may be said that the operation of excision—of admitted value in some cases of necrosis—offers not a single advantage over that of mobilization in aural sclerosis, but is, on the contrary, dangerous. Politzer's section of the posterior fold of the membrana tympani will often secure (and has done so in my hands) all the results in diminishing tension and tinnitus which have been reported as resulting from excision, and has the immense advantage of being safe, and almost without proneness to set up acute changes. Yet its distinguished inventor does not claim that the results are permanent.

The technique upon which I have most relied during the last three years for the control of distressing tinnitus after routine measures have failed, consists in *freezing the mastoid region* over the branches of the posterior auricular and stylo-mastoid arteries by means of a rhigolene or ether spray. The skin is frozen white over the entire mastoid area—of course with proper caution—at intervals of from one to six weeks, for an indefinite period; the results being almost invariably good, and "cure" of the tinnitus in a certain proportion of cases. The method was publicly used and lectured upon by me to the Polyelinic class in the fall of 1887, and has since been used continuously with increasing confidence. The exact explanation of the result is somewhat doubtful; the well-known vasomotor effect of freezing methods are, however, well known, and it is doubtless by means of the nerve influence, acting through

¹ Transactions American Otological Society, 1880.

cholesterin. Subsequent examination showed that this fluid contained 5 per cent. of urea. An incision was then made through the very dense wall of the cyst, which was fully one-third of an inch thick, and the cyst edge was stitched to the abdominal wall, a glass drain being inserted. Before this was done about another twenty ounces of fluid escaped, containing bits of dark-brown material, the size of marbles, evidently old blood-clot, and a layer of this material lined the inside of the cavity.

For the first few days all went well, the cyst being carefully irrigated twice a day, whilst there was a fresh discharge, evidently consisting partly of urine, with pieces of old blood-clot. The discharge then became very putrid, the temperature was considerably elevated at night, the patient got much thinner, there were profuse sweatings, and the urine passed by the urethra diminished in quantity until it fell to as low as sixteen ounces, with only 0.75 per cent. of urea, and it was constantly alkaline. The cyst was at the same time steadily shrinking, and as I could not but feel that nephrectomy under these conditions would pretty certainly prove fatal, I refrained from further operation. By the beginning of July matters had begun to mend; the temperature was practically normal, the urine rose to between twenty and thirty ounces, with increase in the amount of urea, and its reaction was acid, whilst the discharge, which was less offensive, diminished considerably.

October 30. The patient left the hospital, with a sinus still discharging, but otherwise well. The urine passed was fifty to sixty ounces in twenty-four hours, specific gravity 1014 to 1020, acid, and with no abnormal constituent.

He has now been at work several months, is looking well, and has regained the weight he lost. From the sinus there is a small amount of purulent discharge, smelling of urine, but it does not amount to more than a few drachms in the twenty-four hours, and is but a slight inconvenience.

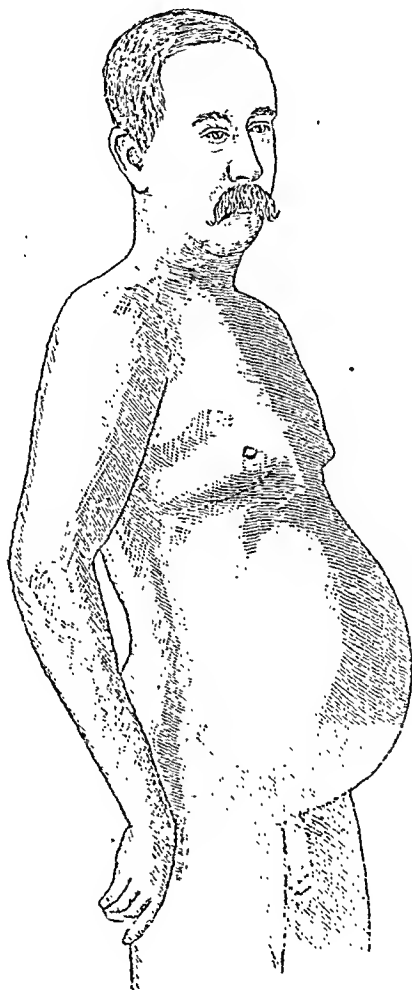
I have placed before the patient the alternative to his present condition, viz: nephrectomy, but he is so well able to do his work and to get about that he declines to have any further operation done at present.

My explanation of the origin of the cyst is as follows: The injury referred to lacerated the kidney-substance, the split running into the pelvis, and, as no blood was seen in the urine, the ureter was probably plugged with clot. Hæmorrhage then, with retained urine, distended the pelvis of the kidney, and in all probability caused atrophy of the kidney-substance to a considerable degree. After the operation, when the cyst was suppurating profusely, the urine passed from the bladder became ammoniacal, and contained phosphates and bacteria, so there was probably a communication reëstablished between the remnant of the kidney-substance and the bladder, though it is doubtful if that still exists, as the urine is and has been for a long time acid, and free from phosphates, etc., whilst there is still a purulent discharge from the sinus.

as an orange. This slowly increased in size until the last few weeks, during which time the increase in size has been rapid. The patient, formerly a fat man, has lately lost flesh rapidly.

Puncture with a hypodermic needle drew off brown-colored fluid, which contained blood-corpuscles, large granular or exudation corpuscles, and cholesterin.

The urine for twenty-four hours was forty-three ounces, specific gravity 1020, acid, without deposit, and free from albumin and sugar.



April 30. An incision four inches long was made over the most prominent part of the tumor, and on opening the abdomen a dense, white capsule presented itself, showing, over an area as large as a crown-piece, a staining with blood round the needle-puncture. The hand passed into the abdomen failed to find any intestine in front of the cyst, the limits of which, easily determined from the liver above, could not be defined in other directions, though the wide base evidently occupied the region of the kidney. A large trocar emptied seventy-two ounces of cocoa-like fluid with a slight urinous odor, and containing a large quantity of

The former he may receive in a hospital, and it would often be a mistake to advise any other course; but there are many cases of the more appreciative class for whom outside care, though more difficult, is more comfortable, as conducive to happiness from more congenial surroundings.

Although we may not all be willing to follow Maudsley to the extent of accepting his dictum "that all the comforts which an insane person has in his captivity are but a miserable compensation for his entire loss of liberty—that they are petty things which weigh not at all against the nightly suffering of a life-long imprisonment," we should do well to keep in mind the necessity for the fullest freedom that is compatible with the welfare of the insane person, and the fact that to quiet and regularity of life may often be added the enjoyment of a comparatively domestic environment without detriment to the patient's condition or the safety of others.

But by far the most potent reason why the physician should be acquainted with the various expedients for caring for the insane person privately, is the injury to the patient's future career from the unjust and often absurd popular prejudice about hospitals for the insane. If a patient can be treated out of an institution and recover, it is better for the physician and for him. Often no alternative is left us than to cast about for the next best place for one for whom asylum care would be far preferable, but whose dread of an asylum life is as unconquerable as it is unreasonable. It is an axiom, also, that, given the means and knowledge of proper treatment, one cannot receive the same personal care when he is one of a large number as when treated alone, or with but few others, although there are certain insane patients whose self-feeling is so great that they are better off for finding that they do not receive more attention than others around them.

Again, the presence of a large number of insane people exerts, in many cases, a depressing influence which may be a serious drawback to improvement, not to mention social and other differences, which would keep them apart if they were well. While there are recovered patients who recall with the greatest pleasure their asylum experience, there are many more who fear a second attack chiefly because it means a return to a place that they only think of with dread. This is often true to some extent of any surroundings in which they may have been treated, but in the various gradation of methods from asylum to home care, I think the feeling is less strong as we reach the latter.

Private care and treatment may be had—

1. In travel.
2. At home.
3. In specially provided private quarters (single care).
4. At small private establishments for mental disorders.

To select appropriate cases for these different methods, without

THE SELECTION OF CASES OF INSANITY FOR DIFFERENT METHODS OF PRIVATE CARE.

BY HENRY R. STEDMAN, M.D.,
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THE time-honored warning against delay in removing a patient who is insane to an institution for that class—based, as it is, on the most conclusive evidence as to the great preponderance of recoveries in cases of early admission—is still needed, although statistics show much improvement in this respect of late years. This advice, however, applies with much less force to the well-to-do than to the poor; but owing to the fact that early commitment to a public asylum is highly advantageous to the poor—for whom home or private care is, as a rule, impracticable if not impossible—and as the dependent class comprises, of course, the bulk of the insane, this custom has come to be looked upon by many as indicative of early asylum care for all classes—to the exclusion of non-institutional methods which, when properly selected, are attended with equally good results. The injunction should be, therefore, to place the patient as early as possible under treatment suited to the individual case, whether in an asylum or outside its walls.

The numerous requirements for satisfactory treatment and care of the insane, especially the private class, call for a variety of methods; but these are necessary and obtainable without as well as within the asylum. The former are of the natural, private and domestic order suited to the wants of the individual; the latter of a more artificial, public and official nature indispensable to the organized care of a large number. Each of these forms of care has its advantages, although the hospital for the insane, with its varied means of treatment, its safety, skilled attendance, regular exercise and mode of living, the administration of medicines and regulation of diet, has a great advantage over private care and treatment of the mass of the incurable, and a large proportion of the presumably curable, insane. It is almost unnecessary to say that there are more insane patients cared for at home, who from their lack of means would be benefited by asylum care, than there are inmates of asylums who would have been better situated under other surroundings. Still, we should recognize the fact that each kind of care has, besides its appropriate cases, certain unsuitable ones which should be in the other class, and that achievements in hospital construction, appliances and methods generally, and the advances thereby made in alleviating insanity, have attracted attention away from the *modicum* of good that is to be found in other surroundings.

Moreover, it is by no means an easy matter to strike the correct balance between the patient's well-being, physical and mental, and his happiness.

depressed, have been suffering from insomnia, who perhaps lack their former energy and interest in life generally, to whom petty annoyances have assumed the guise of great troubles, whose affection for their family is lessened, and who are in a lowered physical condition.

For such, travelling—preferably by land—is often beneficial. The object is to take the patient away from the painful subjects of thought about him at home, to awaken his interest, and to substitute new and pleasant ideas for morbid and distorted ones. A companion is essential. This is not a superfluous caution. Depressed patients will sometimes beg to be allowed to go away alone, as did a gentleman who came under my observation recently, and who, for want of proper insistence on the part of his advisers, actually crossed the ocean alone, but was so wretched that he fortunately returned on the next steamer. The companion should be cheery, tactful, and alert. A friend is better, as a rule, than a relative, who will be apt to let the patient have his own way too much. A young physician may be of great service. In the more anxious cases an intelligent nurse, if it can be managed, will help greatly. Travelling should be done by day to secure sufficient night rest. Fatigue should be avoided, it being better to remain in a few places of interest than to travel about and change the scene too frequently. Often a higher latitude than that in which the patient lives proves a tonic, while a southern climate is found too relaxing and depressing. Long sea voyages rarely prove useful: in most cases within my knowledge these have been failures, and Blandford finds that there is something about the seaside which tends to convert the preliminary stage of confusion and depression into wild excitement, and prefers for this reason to send patients for change to an inland place. Convalescing cases are particularly susceptible to the advantages of travel, and often gain faster in this way than in any other change. Another class who are especially benefited by slow travel or change to a country life, with plenty of fresh air, are mild cases of mental disturbance, due simply to the exhaustion of fever—post-febrile insanity.

Next, as to home care and treatment. Everyone knows that there are a large number of insane persons living at home, some comfortably situated, some among tolerable surroundings, and others wretchedly cared for. We also know of not a few patients who recover at home quite as quickly and thoroughly as do asylum cases. What is the character of these cases who do well at home, and how can we prevent their haphazard disposal, some at home and some in confinement? Which are the neglected cases that need asylum care?

If some very general laws can be indicated and followed as to the selection of cases, more would enjoy the liberty and comfort of home who should have it, and others the skilled treatment of a well-equipped hospital for the insane. As a step in this direction the form of insanity

including those for whom the asylum is best adapted, is no easy matter, for no rules can be laid down, patients are so variously disordered in mind and so variously circumstanced. Consequently, only general suggestions are offered, which in many instances may require modification to meet the special circumstances of individual cases.

It is very largely a question of means whether a patient should be treated in either of the ways indicated or at an asylum. The more violent, difficult and prolonged the case, the greater the expense. The worst cases can be cared for in special private quarters with a sufficient number of nurses and frequent medical visitation—although even the continuously disturbed incurable cases and the desperately homicidal, suicidal or self-mutilating can never be managed privately with anything like the efficiency of a well-conducted asylum, with all its resources in the way of modern principles of treatment and arrangements adapted to the requirements of the present time. For, the moderately wealthy, the acute curable cases, and certain of the chronic class to be specified later, may properly receive private care, and a fair proportion of them at home, under proper supervision and nursing. Cases of the remaining forms of insanity in this station of life should, broadly speaking, have asylum care. If the patient be poor, the cases are rare that can with safety or benefit be kept from a hospital for the insane.¹

But first, as to travel. This should be prescribed for cases that can hardly be called insane, as they are mainly on the threshold of mental disturbance. It is rare that the continued diversion and exercise attendant upon travel is of use when the disease has become pronounced (when actual delusions have set in), even though they occur early in the disorder. The most carefully selected early cases are benefited by travel, because brain-rest is usually the indication from the start rather than diversion and change.

I have known more than one melancholiac for whom travel had been tried at this stage who became bewildered by the frequent change of scene; irritated at having to meet people when they wished to avoid them, and were worse for the change. One patient, in addition to her other false beliefs, contracted the delusion that she was being taken about to different places to be exhibited. It is very hazardous, also, to advise travel for a patient in whom there is even a suspicion of suicidal intent, as it is impossible for the most careful to be watchful enough upon a journey.

Suitable cases for travel are for the most part those who are simply

¹ But even among the poor we meet exceptional cases where the delay of a week in proposed removal to the asylum has been attended with sufficient improvement to warrant the hope of a speedy recovery. Such instances, however, are only mentioned to emphasize what is possible in the way of home life for the insane, and to show that they sometimes do well in spite of their surroundings.

moil and wears upon his relatives so as to affect their health and spirits by the constant attention he requires, or unnecessarily exacts, home is not the place for him. It is sometimes best, if the patient remains at home, to send away any children there may be in the family, as they are an especial source of anxiety and unnecessary worry, particularly to a mother, because of their unthinking demands or because she imagines they are being neglected, and sometimes because there is danger to them from the mother's homicidal tendencies.

Melancholia, of all the forms of insanity, is oftenest treated at home, because cases of this variety are vastly more numerous than those of any other, because its manifestations are usually far less pronounced and less difficult to deal with, and because it is especially frequent in a mild form. There are quiet cases simply depressed, who for a long time are able to live in the family without harm, who perhaps have tried travelling and change of scene unsuccessfully. Their life can be regulated and made much more comfortable by the physician with intelligent help from the relatives, and nursing or companionship. But the mildness of an attack of melancholia is by no means incompatible with unexpected suicidal and other impulsive outbreaks, and here is applicable the attention to details advised above.

Besides close inquiry as to the possibility of suicidal ideas, the patient's heredity should be investigated. It is an established fact that this propensity is highly hereditary and colors the insanity of descendants in the large majority of cases. Melancholia without delusions is a fertile soil for such tendencies. I recall a patient in a large asylum who made repeated sudden and desperate attempts at self-destruction, who in the intervals was sociable and agreeable, though with a tinge of sadness, and appeared otherwise entirely rational, having no delusions whatever. In her case the family history was very bad as to suicide, but was ignored by her relatives when she became depressed until she suddenly attempted to hang herself, and nearly succeeded, when she was committed to an asylum, where it proved to be a marked suicidal impulse.

Other quiet patients are the *acute demented*, young people who usually make good recoveries. Their state of inertness—stupor—renders them good subjects for home care. They require to be dealt with in many cases like babies, as they cannot be roused to make the slightest exertion. Often it is only a matter of nursing. Here it is necessary to guard against injury by the struggles of certain of this class who resist doggedly all attempts of any sort to help them, as well as the sudden and most unlooked-for outbreaks which sometimes occur.

As to disturbed *violent cases of the acute, curable class*, there are more, especially among those in good circumstances, who should have the benefit of home treatment than is now the case. I fully accept Folsom's belief, who reports several instructive cases of this kind successfully

must be considered, as well as the make-up of the patient's family, his attitude toward them, and the character of his surroundings generally.

But whatever the form of the malady or situation of the patient, it is often the amount and kind of attention the physician gives to the ease that will ultimately determine between home and the asylum for the patient, and perhaps between recovery and confirmed insanity. This is not platitude. There is little doubt that more cases would do well at home if they were as carefully and regularly observed as are cases of physical disease. It is not enough to study an apparently mild case of melancholia occasionally and at long intervals; to have him come to the office, or to inquire of the family how he is getting along. It is a lack of attention to details, of close inquiry into the patient's line of thought, both from him and the members of his family, to ascertain the progress of the disease, that has made more than one case turn out disastrously. The fear of suggesting suicide to melancholic patients by inquiries in that direction I am convinced is exaggerated. I have never known it to occur, but on the other hand, the instances when occasional unobtrusive but minute inquiry of the patient and family as to this particular has been avoided, and disaster has come, may well make us consider whether one's whole duty is done when this precaution is not taken. The neglect of attention to the details of the patient's requirements has led to the disrepute into which home treatment of proper cases of insanity has fallen, quite as much as the attempt to treat unsuitable cases in that way. Home treatment for curable cases seems to me to bear to that of ordinary disease the same relation as does the capital operation and the after conduct of the ease. It requires much time, constant watchfulness, attention to a variety of minor details and the summoning of special skill in emergencies. Before counselling home treatment, the feeling of the patient toward the members of his family is an important matter. If he has strong and increasing antipathies toward one or more of them, and dangerous delusions about them are persistent and uppermost in his mind, or if suicidal thoughts and attempts are prominent manifestations, little is to be gained and much valuable time may be lost in delaying his removal from home, unless the physician is prepared to convert the house into a hospital on the presumption that the case is a curable one. Often, however, the home feeling remains strong, as is shown at more rational intervals, and at no time is alienation from those dear to him appreciable. To such patients it is an immense satisfaction to have their friends at hand. Moreover, the influence of a relative in calming a patient can often be exercised by no other. Cases marked by great anxiety in which ordinary petty annoyances are so magnified as to weigh down and distress a patient are better for a change from home. The effect of the patient upon the family, also, is important. If he keeps the household in tur-

them entirely out of harmony with their surroundings, that removal from home becomes urgent.

Chronic degenerative insanity is not often suitable for care outside the asylum, except during the initial stages, while the patient is comparatively appreciative. With the advent of delusions of suspicion comes often more or less violence, noise, self-neglect, refusal of food, destructiveness, perhaps—conditions which cannot be properly met by ordinary means.

There are certain classes of cases the treatment of which is often improperly tried at home. I refer to *hysterical insanity* and *dipsomania*. The former rarely improve until they come under systematic control and judicious neglect—unless years are consumed in the process—whereas asylum care and discipline will sometimes give young women so afflicted a wonderful and speedy start in health and control.

Cases of dipsomania, although not properly coming into the category of insanity, are surpassed in difficulty of management by few of the actually insane, and in far-reaching effect of the malady upon the patient and his family: 1. Because of the length of time before their condition is realized, and the credulity of the family in the victim's promises of reform, and particularly by the fond mother's natural trust and long-sufferance of the son's disgraceful life, which fatally delays proper treatment. 2. The absence of proper provision for such cases in the shape of a closed asylum exclusively for that class, under a board of disinterested trustees and State control. 3. The difficulty of keeping them in a lunatic asylum when once committed thence, owing to their cunning, the dislike of the medical officers for that class of cases, who are a disturbing and otherwise trying element, and the importunities of the patient, and his relatives sometimes, before he has become sober. Advice of great value is not to be had concerning these patients under these circumstances. All that I can say is, that a State lunatic asylum to which the patient is legally committed, as is the case in Massachusetts, is after all by far the best place for him; that the friends should be discouraged as long as possible from removing him, and the superintendent begged, as often as we can decently do so, to keep him there. Small private asylums, particularly where there are insane inmates, are unsuitable places, and but temporary makeshifts, for the inebriate class.

The separate care of *acute cases of insanity* in a house or villa hired for the purpose—what is called single care—is practised but little in this country. In England it is more in vogue, and looked upon as specially valuable. The treatment should be undertaken in a house belonging to a physician, or in a private house taken by the friends for the purpose. It is essential that the attendants should be under immediate control and supervision of the physician to whose hands the patient's care is entrusted. It is perfectly easy to manage matters for excitable and even noisy and violent patients, if the house be in a quiet neighborhood, and

treated by him at their homes, in support of his opinion that many cases at least of mental disease are to be treated precisely like typhoid fever or rheumatism, or a broken leg, so far as removal from home is concerned, and that home associations are no more harmful in properly selected cases than in pneumonia or phthisis. When this course is adopted, the home must be converted into a hospital, and the case conducted methodically with the aid of nurses, or, in exceptional cases, members of the family. The patient should have apartments entirely separate from the rest of the family, especially arranged to meet the emergencies and other requirements of his attack.

In *insanity connected with the puerperal state*, when acute and recent, special exertion and sacrifice should be made to treat the patient outside of the asylum, not only to avoid the stigma of residence there, but because these are highly favorable cases for recovery and are usually of short duration. This applies to difficult, violent patients, as well as to the puerperal melancholiacs, the majority of whom are mild, easily-treated, transient cases. A special precaution is to remove the child from the mother in most cases as soon as possible and to watch her closely. Attempts to destroy the child are specially frequent and suicidal tendencies a common manifestation. The rare cases of insanity of pregnancy should unquestionably be kept at home, at least until after labor, to avoid the sad fate for the child of being born in an asylum.

Of chronic cases *senile insanity and dementia* is by far the best adapted for outside treatment and care. It is only the worst patients one sees at the asylum, while subjects of the milder states of senility in which there is decided mental complication are a numerous class and apt to be provided for at home. Old people, even when insane and regardless of their condition or surroundings, are often disastrously affected by a complete change from home. In consequence of their extreme age they are no longer receptive of new ideas or adaptable to a new environment. The same advice applies to the allied state of mental impairment following hemiplegia and similar attacks following destructive cerebral lesions.

The mass of cases of *insanity of doubt*, are cared for at home. Most of these are on a par with mild delusional patients, who rarely show except to their nearest friends their mental weakness. Very much may be done by the physician in the way of advice, assurance, encouragement, and consequent help to those doubting, but otherwise most intelligent patients, by keeping track of them, and methodically visiting them. Change of abode is often considerable help in these cases. It is only when their doubts become terrible fears that they have made, or will make, fatal mistakes, will contaminate others by their touch, etc., which lead them to take absurd precautions, which withdraw them from others, and interfere continually with their comfort and health—in short, put

to public scrutiny, and have supervisory boards, which divide to some extent the responsibility of the patient's care with the medical head of the institution. Consequently, although, largely, each is what its superintendent makes it, and each has its individual merits, a good and fairly uniform standard of care is reached by all. But the smaller private hospital is conducted largely according to the individual ideas of the physician in charge, so that the standard of care varies greatly in different places, and greater pains must be taken to ascertain how the establishment to which a patient is to be sent is conducted, and only that having the essentials of the most appropriate methods should be selected.

The situation of the patient's future abode is always a matter of importance. Some do better whose friends live near at hand, and can visit them often. Others, for whom visits have proved inadvisable, are constantly unsettled by the thought that their family is within easy reach but that they cannot go to them. Consequently, a distant residence is preferable. The disposal of the patient varies also according to the stage of the disorder in other ways than those mentioned. Just as there are patients who should enjoy family life, during such a time, in the initial stages, as they are appreciative and not unsettled, but for whom too long delay in commitment to an asylum is dangerous, so there are others who require asylum care and no other at the outset, but who should have a trial at home later, the opportune moment for which should be seized without delay. This includes many in the early stage of convalescence (for whom travel is not advisable) when the home can be properly arranged for their reception, as it may often be well to avoid too great a strain by the change involved in a complete resumption of family life and duties at once. Emergence from an attack of insanity to the unfamiliar surroundings of an institution, although rarely actually disastrous, should be prevented if possible. As to the chronic insane in asylums, the more I see of them the more I am impressed with the good effects of change in individual cases. Of course, the proportion to be safely removed from the asylum is small, and of these but a small number will remain away long if not kept under a physician's observation. Still, there is room for improvement in the way of trial outside of the asylum. Even when it does not succeed, the satisfaction of giving the patient another chance before dooming him for life to separation from the world is great, and the effect such a step has in gaining and keeping the confidence of the patient is a great help to all concerned.¹ The experience gained in boarding out in private dwellings the chronic harmless insane

¹ For further advice on this point, a recent article by Schüle on the "Value of Early Discharges from Asylums," is useful. (Report of the annual meeting of German alienists at Berlin, September 17 and 18, 1888.)

with the advantage of perfect privacy. This method is practically the same as that of turning the house into a hospital, except that the latter course is best adapted to a milder class of acute cases.

The small private establishment for nervous and insane cases stands as a means of care between the home and the large asylums. Many patients whose surroundings in a variety of ways are unsuitable for the separate hospital-at-home care, the milder acute, and presumably curable cases of mania and melancholia, are best treated in this way. The patient's family, for example, is scattered, and no single member is ready to bear the anxiety and be responsible for the patient's care at home, and its expense. The case may be of too severe a type for home management without greater sacrifice than the family is willing to make, and they shrink from sending him to a large asylum. The patient has possibly been living at home until he has grown too difficult to have in the family, who have been tried to the utmost. The anxiety and care may be telling upon the health of the husband or wife. Beside recent cases there are varieties of the chronic class of insanity, the subjects of which can be made very comfortable in this way. Examples of suitable cases are the man or woman with fair intelligence, but deficient self-control, whose mind is weakened (congenitally, or by an attack of insanity), for whom family life has proved unsuccessful, owing to bad tendencies and mistaken indulgence; the case of doubting insanity which has gradually grown to dread everything, and by whom no authority that can be exercised at home is respected. Hysterical and neurasthenic cases, of a severe type, are often most amenable, when thus situated away from too sympathetic friends, and under control amid fairly congenial surroundings. The demented general paralytic can be treated at a well-conducted home-hospital of this character, where separation of uncongenial patients is available, at considerable saving of family worry, mortification and expense. The life of the chronic melancholic, so situated, can also be made fairly bright; many border-land cases, also, for whom domestic life has proven a failure, are especially susceptible to guidance and control, when exercised among such conditions in a semi-domestic environment. Such establishments thrive largely on a public dread of asylum-care for a relative, as well as upon the greater privacy to be secured by the method. For the same reasons, patients are often sent from home to irresponsible people for care, who are subject to no supervision themselves, and seek for no medical advice for the patients under their charge. Without a resident physician, none of the classes mentioned can be properly treated in a home devoted to the care of the insane, and expert supervision, capable nurses, companions or attendants to meet the requirements of widely different cases, as well as regular inspection by State medical officials, are essential for the best results. The public, or large private asylums, are subject

but was relieved by dilating the os internum just before the flow. Two years later she became pregnant again, and I delivered her by high forceps without local injury, except a slight laceration of the cervix. Her convalescence was normal. The prolapsed ovary gave her some trouble during her pregnancy, but was not tender when I examined her three weeks after labor, and introduced a pessary in order to correct a tendency to retro-displacement and prolapsus. I treated her several times for the ovarian tenderness, but after a few months the pessary was removed, and she menstruated without pain, provided that the os internum was dilated, as before, previous to the flow, for the antelexion persisted. Eight weeks ago I was called to see her. She had been in excellent health for several months, menstruating regularly and without pain. Her monthly flow had begun the day before, and was followed by severe lancinating pains in the right ovarian region, which radiated down the back of the thigh and across to the opposite groin. The patient is more than usually courageous, and certainly did not exaggerate her symptoms. She possessed a marked tolerance for analgesics, and was given large doses of morphine, antipyrine, and anti-febrin, with only temporary relief. On palpating the abdomen I found extreme tenderness over the right ovary, while by the vaginal touch the organ could be felt distinctly enlarged and very sensitive. No rise of temperature or acceleration of the pulse. Diagnosis: Congestion of the ovary, the cause being unknown.

I advised hot applications over lower portion of abdomen, hot vaginal douches, and phenacetin, ten grains, to be repeated in an hour. No relief was obtained, and it was necessary to give *Majendie* *m.xx* during the night, to render the pain bearable. Next day the mild galvanic current was employed, one sponge being placed over the sacrum, the other over the right ovarian region; it increased the pain, and was discontinued. As menstruation had ceased, glycerin tampons were used with the idea of supporting the enlarged ovary. They afforded only temporary relief. The patient at this stage became very much discouraged, and began to wonder if oöphorectomy would not be necessary.

After three or four days of ineffectual treatment, I noticed that the pain seemed to be most severe in the afternoon, that it reached its acme during the night, and gradually subsided during the morning hours. Careful inquiry developed the fact that the patient had had a well-marked attack of intermittent fever of the quotidian type a few months before, which yielded to twenty-grain doses of quinine in two or three days. The chill occurred in the afternoon. There had been no history of malarial neuralgia since then, but, noting the apparent periodicity and neuralgic character of the ovarian pain, I determined to test the value of quinine. On the following day twenty grains were given in the forenoon; the pain was much less severe, so that the patient was able to sleep without an anodyne. A repetition of the dose on the next day resulted in a complete disappearance of the usual sharp, lancinating pain, only a soreness remaining at its former site. On the third day the dose of quinine was reduced to fifteen grains, and on the following day to ten, which was given daily for a week. *The pain did not reappear.* The patient came to my office at the end of ten days, and reported herself as feeling well, and able to walk half a mile without pain or weariness. Local treatment (tampons and galvanism, with hot douches) was employed for a few days and was then discoun-

taken from asylums in this and other countries, indicates the possibilities in this direction.

A great deal might be written upon the details of treatment peculiar to the kinds of care here considered, but it only remains to be said that modern asylums, under progressive management, by introducing new styles of buildings and arrangements looking to the greater segregation of the insane, are doing much to fill the want of natural domestic surroundings.

THE MALARIAL ELEMENT IN OÖPHORALGIA.

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THE terms "oöphoralgia" and its hybrid synonym "ovaralgia," have been used somewhat vaguely to describe pain in the region of the ovary which does not seem to be due to actual disease of that organ. Ols-hausen is the only writer on diseases of the ovaries who devotes a separate chapter to oöphoralgia, which, with Charcot, he seems to regard as a hysteroneurosis. Now, I know no reason why we should not regard certain pains in the ovarian region as purely neuralgic in their character, even though they may be primarily due to disease in or around the ovary which is not appreciable clinically. The question of the anatomical cause of ovarian pain I have discussed at length in a paper in Wood's *Reference Handbook*; it is sufficient to state that I believe it to be more frequently of extra- than of intra-ovarian origin, *i. e.*, it is due rather to the inclusion of nerves in perimetrial adhesions than to the pressure upon terminal filaments by cicatricial tissue within the diseased gland, as is shown clinically by the relief afforded by separating such adhesions without removing the affected ovary. The subject of ovarian pain, whether menstrual or inter-menstrual, assumes no little importance from its bearing upon abdominal section, though happily it is now, *per se*, seldom regarded as a sufficient indication for laparotomy. Contributions to the palliative treatment of ovarian troubles should always be welcomed, and this is my excuse for presenting the following case:

Mrs. M., aged twenty years, was first seen by me four years ago, soon after she had had an abortion at six weeks. She was suffering with severe pain in the right ovarian region, unaccompanied by evidences of acute inflammatory trouble. Examination showed well-marked ante-flexion, with prolapse of the right ovary, the gland being neither much enlarged nor especially tender. Her husband, himself a physician, treated her locally, and she was soon up and about. She had had moderate dysmenorrhœa before marriage, which continued afterward,

SUMMARY.—Each case occurred in the practice of other physicians, through whose courtesy I was called in consultation. Sex: Males 48, of whom 18 recovered; females 52, of whom 15 recovered. Total, 100 cases, with 33 recoveries. Of these cases 65 were treated with full doses of the bichloride of mercury, and 18, or 27.6 per cent., recovered, while 35 were treated on the expectant plan, or with some preparation of iron, and 15, or 42.8 per cent., recovered. In every case it was considered of primary importance to give as large an amount as possible of food and stimulants. It should, however, be remembered, in considering these results, that during the past year the internal use of the bichloride of mercury in the treatment of laryngeal diphtheria has been very widely practised, and its advocates may claim, and do claim, that under its use an operation became necessary in a much smaller proportion of the cases, and that, therefore, operative interference was needed only in the unusually severe cases which were not controlled by this drug.

Average age, three years six and three-quarter months; of those that died, three years five months; of those that recovered, three years eight months (one adult case was omitted in this calculation). In fatal cases the average length of life after intubation was two days and two hours; in cases of recovery, the average time of tube in the larynx was six days and ten hours. Urine contained albumin in 51 cases, no albumin in 7 cases, and was not examined in 42 cases. At the time of operation twenty-one of the patients were suffering from severe sepsis, and others had the laryngeal diphtheria complicated by measles, scarlet fever, pregnancy, pneumonia, bronchial diphtheria, and pertussis.

During the period of time covered by the foregoing summary, namely, October 28, 1888, to November 30, 1889, in addition to the cases of laryngeal diphtheria, the details of which are given in the notes, I was called to see twenty-nine cases of diphtheritic laryngitis, besides a number of cases of dyspnoea, due to catarrhal disease, two cases of pneumonia, four or five cases of naso-pharyngeal obstruction from diphtheria, one from post-pharyngeal abscess, and one from a combination of enlarged tonsils and adenoid vegetations in the vault of the pharynx. Of the cases of laryngeal diphtheria, three died before my arrival,¹ fourteen recovered without operation, it being decided by the attending physician and myself that it would be wiser to defer the operation until the stenosis became more severe. Of these cases two occurred in my own practice, and the remaining twelve in the practice of others.² Eight had undoubted laryngeal diphtheria, but the obstruction as

¹ One with each of the following gentlemen: Dr. Osgood Mason, Dr. H. D. Chapin, and Dr. DeWitt Hitchcock, of Long Island City.

² Dr. H. G. Lyttle, Long Island City, Dr. G. V. Hann, Dr. David Froelich (2), Dr. G. D. Spor, Dr. R. B. Talbot, Dr. Bernard Hughes, Dr. E. V. Silver, Dr. D. H. Stewart (this case also had pneumonia), and Dr. Leonard Weber.

tinued. The next menstrual period was unattended by pain in the ovarian region. At the time of writing the patient is feeling as well as ever.

A somewhat extended search through the literature has failed to reveal a similar case of ovarian neuralgia which showed such an evident paludic origin, and yielded so promptly to pure anti-periodic treatment. In all other treatment in which quinine was employed it was given in small doses (two or three grains), combined with morphine, aconite, or muriate of ammonia, and there was no malarial history. While the paroxysms of pain in the case reported were, doubtless, at the outset due to ovarian congestion, it does not militate against the fact that they showed a marked periodicity in their onsets. The fact that they were absent at the succeeding period is, in my opinion, a proof that the malarial poison had been overcome by the thorough course of quinine. It might be attributed solely to the effect of the local treatment during the intermenstrual period, were it not for the fact that the patient had been under similar treatment before, and had felt perfectly well up to the time of her attack of dysmenorrhœa.

It seems to me that we are justified in regarding this case as one of malarial neuralgia affecting the nerves in and around the ovary, and comparable with similar neuralgia of the trifacial, except that here the pain was undoubtedly due to actual organic disease; but it assumed a periodical character through malarial influence, and was controlled by quinine.

THREE HUNDRED CASES OF INTUBATION OF THE LARYNX FOR DIPHTHERITIC CROUP.

BY DILLON BROWN, M.D.,
OF NEW YORK.

In the following pages it will be my aim to present an accurate report and analysis of the croup cases which have been seen by me since my last paper¹ was prepared.

This report includes the results not only of the cases which were operated upon, but of every case of laryngeal diphtheria which came under my care during this period of time.²

¹ New York Medical Journal, March 9, 1889.

² In the thirty-three cases of recovery, the names of the attending physicians by whose courtesy I was enabled to operate are: Drs. C. W. Bolinfolk, H. G. Lyttle, G. V. Hann, J. Lewis Smith, J. Lewis Smith, Jr., J. A. Roth, D. H. Stewart, G. C. H. Meier, G. D. Spor, J. R. Cypert, S. S. Jones, T. B. Columbia, Beverley Robinson, W. H. Lyons, Leo Schnepp, M. M. Dunton, A. Y. Reid, D. F. King, G. F. Morris, B. G. Strong, DeWitt Hitchcock, J. H. Lurie, and J. Henry Fruitnigh.

TABLE I

Extension to Bronchi	Sepsis	Sudden Heart Failure	Pneumonia	Exhaustion	Uremia	Scarlet Fever	Asphyxia of Lungs	Total
37	19	3	2	2	1	1	1	67
55.2	20.5	4.4	3.	3.	1.4	1.4	1.4	
55%								

Number of Cases
Per Cent of Cases

55%

50%

45%

40%

35%

30%

25%

20%

15%

10%

5%

0%

This table shows the relative number of deaths from each cause.

TABLE II

Number of Cases	1 to 2 days	2 to 3 days	3 to 4 days	4 to 5 days	5 to 6 days	6 days and over	Total
Per Cent of Recoveries	19	41	23	11	3	3	100
	36.8	44.4	43.4	46.4	0.	33.3	33.3

Number of Cases
Per Cent of Recoveries

45%

40%

35%

30%

25%

20%

15%

10%

5%

0%

This table shows the percentage of recoveries according to the duration of laryngeal symptoms before operative interference became necessary.

TABLE III

Number of Cases	1 to 2 days	2 to 3 days	3 to 4 days	4 to 5 days	5 to 6 days	6 days and over	None	Total
Per Cent of Recoveries	10	10	13	7	5	19	12	76
	30.	10.	7.7	14.2	40.	57.8	50.	

Number of Cases
Per Cent of Recoveries

60%

55%

50%

45%

40%

35%

30%

25%

20%

15%

10%

5%

0%

This table shows the percentage of recoveries according to the duration of pharyngeal or nasal diphtheria before operation became necessary.

shown by the strength and extent of the respiratory sound, was not sufficient to cause danger, or even discomfort, and therefore an operation would have been of no advantage, but rather the reverse. Of these cases all died.¹

NOTES ON CASES.

201. There was well-marked evidence of pulmonary invasion, as shown by high temperature (105° F.), rapid respiration and a dry, boardy respiratory sound. For one month after the removal of the tube, it seemed as if the child might die at any time from diphtheritic marasmus, but the appetite slowly returned and he finally made a good recovery. Patient of Dr. C. W. Bohmfalk.

203 and 204: brothers. These children lived in Astoria. In the first case, membrane was expelled through the tube after the operation; and, in the other case, membrane was coughed up before the operation. The latter was a case of ascending croup, beginning in the trachea and extending up to the subglottic region of the larynx, but not involving the cords. This accounts for the clear voice and the short duration of the dyspnoea, in spite of the fact that the obstruction to respiration was extreme and there was positive evidence of membrane in the larynx. Patients of Dr. H. G. Lyttle.

208. Membrane was coughed up shortly after the insertion of the tube. At the time of operation it seemed like one of the most hopeless of cases. Patient of Dr. J. A. Roth.

209. A brother and a sister died the same week from diphtheria, but in neither case was the larynx involved. Patients of Dr. R. B. Burton.

210. Membrane appeared, for the first time, on both tonsils three days after intubation. The child did well and the tube was removed on the eighth day, although membrane was yet present in the pharynx. For thirty hours the child was bright and playful, and he was apparently doing well. Suddenly there was a rapid rise of temperature, and the patient died in thirty-two hours from an extension of the diphtheritic process to the bronchi. Patient of Dr. J. C. Schmincke.

213 and 215. Both hopeless septic cases from the outset. Patients of Dr. R. B. Burton and of Dr. Branch Clark.

216 and 217: brothers. Hopelessly septic cases. Patients of Dr. H. G. Lyttle.

218. Several days before this child became ill, a brother, aged eight years, died of diphtheria; and following this child's death the mother was taken down with a severe attack from which she recovered. Patient of Dr. E. A. Bracklow.

220, 222, 227 and 228 were absolutely hopeless cases. The operation was done to relieve the suffering of the patients. Patients of Dr. R. H.

¹ One was seen with Drs. J. Lewis Smith and Dr. C. J. Dumond, one with Dr. Leonard Dessar, one with Dr. M. Vinton, one with Dr. S. B. Allen, one with Dr. H. N. Vineberg, one with Dr. J. H. Ripley and Dr. L. Emmet Holt, one with Dr. DeWitt Hitchcock and Dr. B. G. Strong, and one with Dr. J. Lewis Smith and Dr. Henry Griswold. Four cases refused permission to operate. All died, as follows: Two with Drs. R. B. and A. I. Burton, and one with each of the following physicians: Dr. J. H. Lurie, Dr. G. V. Hann.

Hayes, Dr. M. L. Healy, Dr. E. M. Moffett, and Drs. A. Jacobi and S. N. Leo.

226. This patient was an adult and pregnant (sixth month). No membrane could be seen either in the pharynx or nares at any period of the illness; and a laryngoscopic examination by Dr. Ripley showed an oedematous condition of the epiglottis and ventricular bands, but no pseudo-membrane. Immediately after intubation, a large cast of pseudo-membrane was expelled. At the time of the operation the patient was comatose and could have lived but a short time. The tube was inserted without difficulty while she was lying on her back in bed. She quickly rallied after the obstruction was removed, and in a few hours seemed to be in a fair condition. She died in forty-two hours from bronchial diphtheria. Patient of Drs. John Ripley and F. A. McGuire.

During the last twelve months I have seen two other cases of laryngeal diphtheria in adults. Both died. The first case, with Drs. Ripley and Holt, suffered from a very severe type of pharyngeal diphtheria, and, although the laryngeal obstruction disappeared, she died from bronchial diphtheria. In the second case, the disease began in the larynx and the patient was unconscious when operated upon by Dr. O'Dwyer. I saw her several hours later. There was moderate adenitis with great swelling of the neck, especially anteriorly. A moderate amount of dyspnoea due to some swelling over the top of the tube. The pharynx was red but no pseudo-membrane was visible. She was pregnant (fourth month). During the next twelve hours most of the swelling of the neck disappeared, but pseudo-membrane covered part of the soft palate. She was conscious and in very good condition, but had not the least recollection of the operation or our visit in the evening. Two days after the operation she aborted, and three and a half days after the operation she died of bronchial diphtheria.

232. This case was followed by paralysis of the ocular and pharyngeal muscles, and of the legs; and for a long time remained in that condition which has been aptly called diphtheritic marasmus. The mother, who nursed the child, afterward died of diphtheria. With Dr. G. V. Hann.

233. All the other children (two) had pertussis followed by scarlet fever and diphtheria. Both recovered.

234. This child was unconscious and pulseless at the time of operation, and it was an hour and a half before she began to rally. With Dr. D. Schmidt.

237. A hopelessly septic case. With Dr. J. A. McLoughlin.

242. The child had marked sepsis. At the time of operation it was pulseless, and although the tube was quickly inserted and plenty of air entered the lungs, the child never rallied, dying in about fifteen minutes. A second child in the same family, older and not septic, recovered after tracheotomy. Patient of Dr. W. B. Pritchard.

241. This child was profoundly poisoned by the diphtheria, and convalescence was very protracted. Child of Dr. H. G. Lyttle.

246. An older sister had scarlet fever and diphtheria, and the mother had a mild attack of pharyngeal diphtheria. Both recovered. Patients of Dr. J. R. Cypert.

247. This was a case of ascending croup. With Dr. Alexander Hadden.

TABLE IV

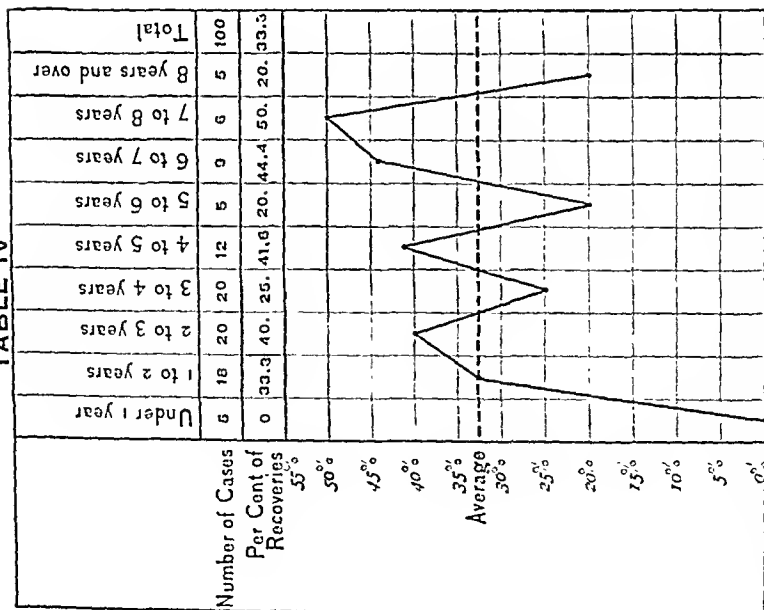
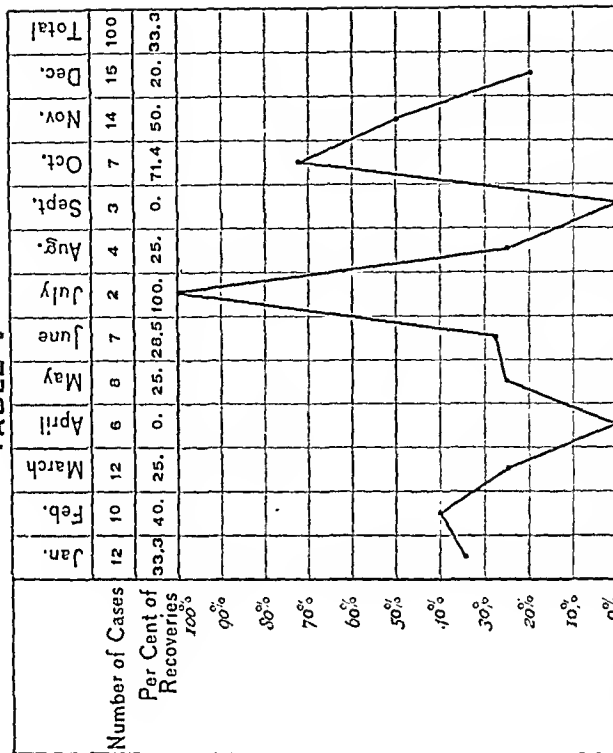


TABLE V



of cold in the end of the tongue, while Moos,¹ Wilde,² and Urbantschitsch³ cite cases in which irritation of the exposed chorda tympani caused abnormal sensations in the tip of the tongue. Brunner⁴ and Urbantschitsch⁵ mention cases in which division of the chorda tympani caused total loss of taste in certain portions of the tongue, the function gradually returning to a greater or less degree; while McBride⁶ reports a case in which the removal of an aural polyp was followed by almost complete loss of the sense of taste in the corresponding side of the tongue. Carl⁷ observed in a case of chronic purulent otitis media, that there was perversion of the sense of taste in the anterior two-thirds of the tongue. Following in this line, Urbantschitsch⁸ investigated fifty cases of purulent otitis media, with the result that, in nearly all, more or less perversion of the sense of taste existed upon the affected side.

In all of these observations the sense of taste was affected, but we find no mention of any pain. In a case reported by Noyes,⁹ in addition to the perversion of taste, there was a feeling of fulness and heaviness in the affected side of the head. Hartmann,¹⁰ quoting Moos, states that trigeminal neuralgia may be an accompaniment of acute purulent inflammation of the middle ear, of chronic mastoiditis, or of cholesteatoma. Roosa¹¹ mentions that pain in the ear, unaccompanied by any gross lesion, is probably due to some pathological condition of the branches of the trigeminus within the tympanic cavity, but I find no mention, in his work, of neuralgia of the trigeminus accompanying a chronic otitis media either of the catarrhal or purulent form. Gruber¹² cites a case reported by Guerder in which neuralgic pain in the maxillary region, accompanied by an herpetic eruption and salivation, resulted from a catarrhal inflammation of the tympanic mucous membrane. Peck¹³ reports a case of acute purulent otitis media, in which severe pain in the last two molars on the corresponding side persisted until the cessation of the aural trouble. The teeth were sound, and the author looks upon the pain as neuralgic, and caused by the inflammation within the tympanum. Jackson,¹⁴ in reviewing the different nervous manifestations occurring in the course of chronic

¹ Arch. of Ophth. and Otol., 1869, vol. i. p. 140.

² Arch. für Ohrenheilk., vol. v. p. 235.

³ Lehrb. der Ohrenheilk., Wien, 1884, p. 302.

⁴ Zeit. für Ohrenheilk., vol. ix. p. 156.

⁵ Op. cit., p. 303.

⁶ Edin. Med. Journ., 1880 and 1881, vol. xxvi. p. 902.

⁷ Archiv. für Ohrenheilk., 1876, vol. x. p. 152.

⁸ Op. cit., p. 302.

⁹ Trans. of Amer. Otological Society, 1884, vol. i. p. 556.

¹⁰ Krankheiten des Ohres, Berlin, 1889, p. 170.

¹¹ A Treatise on Diseases of the Ear, New York, 1885, p. 561.

¹² Lehrbuch der Ohrenheilk., Wien, 1888, p. 419.

¹³ Independent Practitioner, 1883, p. 401.

¹⁴ Lancet, 1877, vol. i. p. 415.

253. Followed by paralysis of eye, pharyngeal and leg muscles. Patient of Dr. J. Lewis Smith.

259. Another child convalescent from diphtheria.

260. During the course of this attack, there were seven apparently complete casts of the trachea coughed out. Most of them had bronchial branches. Patient of Dr. Wooster Beach.

261. A large cast was coughed out through the tube. Patient of Dr. A. B. Pope.

274. There was undoubted bronchial invasion at the time of operation. Marked sepsis. With Dr. E. J. Ware.

275. Unconscious before operation. She rallied in about half an hour. Patient of Dr. J. Harvie Dew.

277. On account of loose membrane below the tube, which the child was unable to expel, I did tracheotomy. Patient of Dr. Charles Milne.

285. There were three casts of the trachea with bronchial branches expelled, the second of which had branches from the sixth division of the bronchi. This was such a remarkable specimen that I have carefully preserved it. With Dr. G. D. Spor.

288 and 290 were hopeless cases. With Dr. J. L. Smith and Dr. D. L. Hubbard.

287. This is the only case I ever saw die during the operation. There was no trouble to place the tube in the larynx, but, at the beginning of the operation, the child was pulseless, and from the temperature and other evidences of pulmonary invasion, was hopeless. There was loose membrane in the trachea, and the child being unconscious, it was unable to get rid of it. With Dr. Henry Muhlfeld.

296. There was evidence of bronchial diphtheria before operation. Patient of Dr. John H. Ripley.

294. Four days before intubation the mother gave the baby a teaspoonful of spirits of ammonia by mistake for lime-water. Hoarseness and dyspnoea appeared in two hours, which gradually grew worse with only slight intermissions, until operative interference became necessary. At this time there were patches which simulated pseudo-membrane on the tongue, and the pharyngeal and buccal mucous membrane, and the child had quite an extensive pneumonia, with a temperature of 104° F., pulse 144, and respiration very rapid. Patient of Dr. G. F. Morris.

CHRONIC PURULENT OTITIS MEDIA AS A CAUSE OF PERSISTENT FACIAL NEURALGIA.

EDWARD B. DENCH, M.D.,

AURAL SURGEON, NEW YORK EYE AND EAR INFIRMARY.

Owing to the rich nerve-supply of the tympanic cavity, any pathological condition of its lining membrane, as we might naturally expect, may be attended by complex nervous phenomena. Thus Toynbee¹ cites a case in which a rupture of the membrane was the cause of a sensation.

¹ Diseases of the Ear, London, 1865, p. 184.

patient was advised that there might be some discharge from the ear, and, the meatus being closed with cotton, returned home. The next day she reported that the ear had continued to discharge a thin, bloody serum since leaving the office the previous day. An examination revealed the fundus of the canal filled with serum, and drying this, a pulsating spot could be seen at the site of the perforation mentioned in the first examination; the drum membrane was reddened, swollen, and opaque, the handle of the malleus being scarcely visible.

For two days the ear was thoroughly cleansed, and boric acid was insufflated; under this treatment the discharge diminished, and the patient returned to her home, the directions being to keep the ear thoroughly cleansed with the syringe in case the discharge reappeared.

Four days later the patient again appeared. For two days she had suffered severe pain in the head and face, the latter being of a neuralgic character, and, as she expressed it, of the same kind that she had suffered from at intervals for the last five or six years; the discharge from the ear was still profuse. Examination revealed the canal much swollen, especially along the posterior aspect. Membrana tympani in much the same condition as at last examination, but at the site of the perforation there was a mass of granulation tissue, about double the size of a pin-head. Pressure on the mastoid was somewhat painful, and over the Eustachian tube decidedly so. A blister was applied over the region of the tube, extending upward over the lower two-thirds of the mastoid, and the patient was ordered to syringe the ear frequently with lukewarm water.

Under the above measures, together with the application of a solution of the perchloride of iron to the granulation tissue, and the subsequent insufflation of boric acid and alum, the granulation tissue disappeared, and the discharge diminished, but did not cease; the neuralgia also was much improved. Next, by means of a Blake middle-ear syringe, a few drops of a solution of silver nitrate, ten grains to the ounce, were introduced into the middle ear, through the perforation in the posterior superior quadrant. The fluid immediately made its way into the pharynx, and the pain, which was rather severe for the moment, soon disappeared.

Four days later the patient called and said that the discharge was much less—in fact, that it was giving her no trouble. She also remarked that there had been no neuralgia. A small amount of boric acid was insufflated, after thoroughly drying the ear, and the patient went out of town, and did not report for four weeks. During this period the ear had given her no trouble, and it had not been syringed, although, in this, the directions had not been carried out. Examination revealed a little thick pus in the canal, and upon wiping this away, granulation tissue was seen in the region of the perforation. A few applications of the perchloride of iron caused these to disappear, and at the time of writing, the discharge has ceased, and the patient is well. There has been no facial neuralgia since the ear began to improve, and the patient says that she has never passed so long a time without an attack, although the general health is no better, or perhaps not quite as good, as it has been in former years.

The membrana tympani, now that the discharge has ceased, shows clearly evidences of former purulent trouble, of long duration. It is calcified in many places, is adherent to the promontory throughout the

purulent otitis, makes the statement that neuralgic pain usually points to an acute exacerbation, but does not go into details.

A careful search through medical literature has failed to reveal any cases other than those cited above, in which a persistent facial neuralgia had its origin in a chronic inflammation of the tympanum, and for this reason I report the following case:

Mrs. M., aged fifty years, consulted me early in June, with the history that, about two months before, she had suffered with an attack of "la grippe" which had greatly impaired her general health. About two weeks before her visit she was seized with severe pain in the right ear, lasting about twenty-four hours, followed by a slight watery discharge, which at the date of the consultation had ceased, although the hearing remained impaired. This ear, upon examination, presented the ordinary appearances of an acute catarrhal otitis media, and under appropriate treatment its function was completely restored, and as it plays no further part in the history, will not be alluded to again. One week after this attack, and one week before her visit, the patient began to have considerable pain in the left ear, and the auricle became tender to the touch; for the relief of this pain, the patient had syringed the ear with warm water, but was obliged to discontinue the use of the syringe, as it increased the pain greatly.

When questioned, she stated that the hearing in the left ear had been dull for about six years, during which time she had been subject to attacks of severe facial neuralgia, involving principally the branches of the first division of the fifth nerve upon the left side; these attacks were more severe whenever she had a cold in the head. She also stated that there had never been any discharge from this ear, or any pain, until the present attack.

An examination of the left ear revealed the hearing much reduced both for the watch and for conversation, and bone-conduction better than aerial conduction. The auricle was tender to manipulation, and pressure in front of the tragus was painful. On introducing a speculum, the canal was found to be considerably swollen, especially along the posterior wall, although there was no localized focus of inflammation. A portion only of the anterior segment of the membrana tympani could be seen, and this was of a dead-white color. The remainder of the membrane was covered with a grayish-white mass, extending outward into the canal for a considerable distance. Gentle manipulation with the eurette or cotton-tipped probe failed to loosen the mass. Under the assurance that there had never been any discharge from the ear, and no previous attack of pain, I proceeded to remove the mass in the canal with the syringe, but although no force was used, the entrance of the water was accompanied by severe pain. Another examination now revealed the entire membrane of a dull grayish-white color, calcified in places and adherent everywhere to the promontory; in the posterior superior segment there was a small opening through which the lining mucous membrane of the tympanum could be seen. This opening was not more than two mm. long and one broad. It was easily seen that the mass in the external meatus had hermetically sealed a perforation, and that by its removal the middle ear had been exposed. In view of this condition and of the history of slight pain the week before, the

conditions of the nervous system less particularly defined, and shall attempt to show practically, in the history of a few cases, the value of this proposition.

Hyperphoria is properly defined as "that condition of the ocular muscles in which, with a minimum of tension, a deviation of one visual line above the other would result." In other words, it is a tendency to upward deviation of the visual axis of one eye when both are supposed to be fixed in a small luminous object, such as a candle-flame, at 20' distance. The eyes are said to be at rest, or in equilibrium, when, without accommodation, the visual axes meet in a small object at the distance of 20'. They are not, it will be remembered, mathematically parallel, but the small angle at their point of fusion may be disregarded.

In hyperphoria there is a derangement of this parallelism by a clonic deviation upward of one of the axes (hypertropia), or by a tonic tendency to destroy vertical equilibrium (hyperphoria). This involves necessarily a lateral deviation—esophoria or exophoria, either or both. (Eso., far; Exo., near). Since vertical fixation is unattainable, no incentive exists for equilibrium of the lateral muscles, and in fact it is not found, except as an accidental and transient manifestation.

To determine the presence of hyperphoria, a special apparatus is necessary. Lateral insufficiency may be detected by the Von Graefe test—inducing diplopia by means of a prism of 6° base down or up. On account of the weakness of the prism, a slight malposition or an approximation to the vertical position would not seriously affect the result. In dealing with the vertical muscles, however, it is necessary to use a prism of 10° or over, when a slight malposition of the prisms from carelessness of the physician or want of symmetry of the patient's head will vitiate the result. Such an apparatus is Stevens's Phorometer (for description see *Arch. Ophth.*, June, 1887). A recent improvement, the substitution for the double horizontal prism of a pair of rotating prisms, greatly facilitates the examination. It is independent of, and its readings are not vitiated by, moderate movements of the patient's head; it reveals the diagnosis instantly, and records the degree of deviation (under 6°).

In testing for hyperphoria, several examinations are demanded. The diagnosis cannot be made, in kind or degree, at one sitting, as the strength of the muscles varies from day to day, owing to temporary and modifying conditions, which may be general or local. Again, if spectacles are worn by the patient they must be accurately centred, or the results will be modified and the true diagnosis remain undiscovered. It has been my practice in cases of ametropia to make the distant tests without correcting lenses, unless the defect of vision is too great to allow of accurate observation, believing that hyperphoria is practically uninfluenced by

entire extent of the membrana vibrans, and, in addition to the perforation already mentioned, exhibits, in the anterior inferior quadrant, evidences of an old perforation, a little larger than a pin-point. This perforation is perfectly dry, and evidently adherent by its margin to the promontory, and has certainly played no part in the present attack.

Looking now at the history of the case, it seems only logical to conclude that the attacks of neuralgia, dating, as they do, from the time that the hearing first became impaired, were due to an inflammatory process in the middle ear, involving some of the branches of the tympanic plexus. The inflammation probably began in the upper part of the tympanic cavity, resulting in the perforation in the posterior superior quadrant, the covering of which I removed at my first examination. This process apparently continued for years, without the formation of enough pus to give rise to discharge, although that it spread to the atrium is probable from the old perforation in the membrana vibrans. Whether the acute exacerbation, from which she had suffered when she saw me for the first time, would have resulted in a discharge, had I not removed the crust covering the perforation, thus admitting air to the tympanic cavity, is only a matter of conjecture. Certainly, in view of the relief obtained from the neuralgic symptoms by the treatment of the aural trouble, the acute attack must be looked upon as a piece of good fortune.

I should not have related the details of the case so fully, had I not believed that trifacial neuralgia, as a symptom of chronic purulent inflammation of the middle ear with very slight discharge, was among the rarest of affections with which we are called upon to deal. Neither would I attribute the neuralgia to this cause, could any other reason be found for it. No other exciting cause existed, and in view of the almost instant relief afforded by treating the aural condition, it seemed hard to believe that they held any other relation than that of cause and effect.

70 W. FORTY-SIXTH STREET, NEW YORK CITY.

A CLINICAL STUDY IN THE DIAGNOSIS AND TREATMENT OF HYPERPHORIA,

WITH A REPORT OF FOUR CASES.

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In this paper I shall discuss one of the propositions enunciated by Dr. G. T. Stevens, of New York—namely, that hyperphoria is responsible for ocular and muscular anomalies, together with other abnormal

muscles innervated by the same nerve? The relation of accommodation to convergence is not disputed; the same relation must hold with the superior and inferior muscles. It must be remembered that these muscles average only one-fifteenth part of the strength of the internal, and yet, however slight, comparatively, their contraction may be, it must be considered. Convergence and divergence are the result of the action of two different nerves; upward and downward deviation, of one only: hence hyperphoria, which is a want of coördination between two sets of muscles receiving their nerve force from a common source, must owe its origin to others than those that operate in the development of eso- or exophoria. Speaking generally, internal squint is associated with and dependent upon hypermetropia; external squint, with and upon myopia. To neither of these errors of refraction can hyperphoria be attributed. That it is present in individuals who have H., M., and As., is no evidence that it arises from those conditions. Stevens's table (*loc. cit.*) quotes 100 cases of hyperphoria (200 eyes) among 45 Em., 42 M., 73 H., and 40 As., but proves nothing. The same figures may be equally well or badly used to demonstrate any other ocular or bodily ailment. Tables adduced in evidence that heterophoria and errors of refraction are the causes of functional nervous diseases—insanity, epilepsy, chorea—because maniacs, epileptics, and choreics have some refractive or muscular anomaly, are equally misleading. Perfect muscular equilibrium is as rare as Em.,¹ and to assert that the absence of it is the cause of nervous disturbances "more than any other," is quite as unreasonable as to say it is the cause of consumption or of smallpox.

Again, hyperphoria is found in every variety of misshapen eye, not exclusively in one. Finally, it is relatively as frequent in emmetropia as in ametropia.

On the other hand it is evident, whatever may be the cause of hyperphoria, that it is a factor in the causation of functional nervous affections in some individuals,² and that its importance in certain cases has not been overestimated. It is admitted that headache, dizziness, and vertigo in neurotic patients are induced by strain of the accommodation, and it is no argument to the contrary to say that because all patients with refractive errors are not subject to these affections that none are. But it is equally unjust to attribute the symptoms entirely to the ocular condition. There must be a constitutional dyscrasia, an exhaustion of the nervous system, a "nervous prostration," a neurotic

¹ "The Relation of Errors of Refraction and Insufficiency of the Ocular Muscles to Functional Diseases of the Nervous System," by D. B. St. John Roosa, N. Y. Med. Rec., April 19, 1890.

² "May Ocular Insufficiency Produce Nervous Manifestations?" By Allen M. Starr, N. Y. Med. Rec., January 4, 1890.

the condition of refraction, and that greater danger of incorrect diagnosis lies in lenses which are not accurately centred than in ametropia. Presbyopic correction, when worn, should be made for all near tests.

The symptoms of hyperphoria cannot be distinguished from the symptoms which belong to other muscular or accommodative strain, and while it is both interesting and instructive to note the presence or absence of the nervous phenomena which are attributed to this affection, no reliable or logical conclusions can be deduced from their enumeration which shall aid in the determination of the cause. They are partly local, largely reflex; the former including diplopia, pain, smarting, burning, etc.; the latter neuralgia, headache, chorea, insanity, epilepsy, palpitation, constipation, etc. My own experience in the treatment of the grave functional disorders of the nervous system, by means of the measures advocated by Stevens and seconded by others, does not permit me to form an intelligent opinion as to their efficacy. Such patients do not ordinarily consult the ophthalmic surgeon, but the neurologist; and although I have frequently examined epileptics and choreics for some evidence of ocular disturbance, it has thus far been my fortune never to have met with a case in which I could conscientiously advise prisms, or tenotomies, as the sole means of relief. On the other hand, the cases of hyperphoria which have been under my treatment have presented no symptoms of insanity, epilepsy, or chorea. They have complained, for the most part, of confusing the letters in reading, pain in the eyes, headache, photophobia, exhaustion following an evening at the theatre or a day's shopping, and of the other well-known complications of accommodative strain. They have been, with singular unanimity, free from mental or intestinal symptoms. From their own unaided description of their sufferings an accurate diagnosis could not be made, and this is true whether an error of refraction were associated with hyperphoria or whether it were hyperphoria in emmetropia.

Diplopia may or may not be present. It should be sought for by every known test, since its discovery is an important item in the diagnosis and treatment.¹ When diplopia exists, the diagnosis may be made by the relation of the two images to each other; when absent, the diagnosis cannot be made without a phorometer.

Do errors of refraction bear a causative relation to hyperphoria? That they do has not as yet been proved, and the assumption of such relation is therefore only speculative. The third nerve supplies the superior, inferior, and internal recti, inferior oblique, ciliary muscle, and iris. There can be no accommodation without convergence. How can there be convergence without simultaneous stimulation of all other

¹ For an elaboration of this part of the subject, see Stevens's article on Hyperphoria, in Arch. Ophth., June, 1887.

No relief followed the tenotomy. The muscles varied in strength almost daily. Add. = $10-20^\circ$, abd. = $10-12^\circ$; circum. $3-8^\circ$.

After the tenotomy failed, I tested Miss N. anew with Stevens's improved phorometer, confidently expecting to find hyperphoria. In this expectation I was disappointed, for though the examinations were made for several consecutive days, *each test showed equilibrium of the vertical muscles.*

My treatment by cylinders, prisms, and tenotomy was a marked failure.

CASE II.—Mr. C., aged forty-six, complained for many years of pain in the eyes, and of headache, which ensued in a very few minutes after every attempt to read or write. During these years he had consulted a number of the most distinguished ophthalmic surgeons in America and Europe, and had used lenses of various kinds, and kept his accommodation paralyzed by dubosia for three months without obtaining relief.

I ordered an accurate correction of his refraction (R. $-25 \text{ } \odot + 0.75 \text{ c. ax. } 45^\circ$; L. $-25 \text{ } \odot + 0.50 \text{ c. ax. } 135^\circ$), and combined these cylinders with a presbyopic glass.

Both pairs improved his vision, but did not lengthen the time he could read without suffering. Subsequent examinations with phorometer showed: Orthophoria far; Exoph. near = 10° ; abd. = 5° , add. = 8° . Prism 3° base in O. U. were of no service.

Mr. C.'s headache and ocular pain were not benefited.

CASE III.—Mrs. L., aged twenty-five, a strong, healthy, phlegmatic woman, with no nervous tendencies, complained of twitching of right lid and pain over right eye, after long-continued reading. She had no *diplopia*, headache, blurring, or photophobia, and finally, no insanity, chorea, or epilepsy. (Dubosia) R. $+ 0.5 \text{ } \odot + 0.1 \text{ c. ax. } 90^\circ = \frac{20}{xx}$. L.

$+ 0.75 \text{ } \odot + 0.5 \text{ c. ax. } 90^\circ = \frac{20}{xx}$. R. *Hyperphoria* = $2-3^\circ$. Exoph. far = 12° , near = 27° ; abd. = 12° , add. = 20° .

Unless diplopia was developed by alternately covering and uncovering one eye, Mrs. L. never noticed it; whether it was constant or not would be difficult to determine.

The above lenses removed the slight asthenopia, and completely cured all symptoms. No other treatment.

CASE IV.—Miss J., of Bloomsbury, Pa., aged nineteen, delicate in appearance, nervous and quick in action; complained of severe asthenopia, neuralgic headache, blepharospasm, and inability to read more than five minutes without either causing these symptoms, or greatly exaggerating them. No diplopia. (Dubosia) R. $+ 0.25 \text{ c. ax. } 90^\circ = \frac{20}{xx}$. L. $+ 0.25 \text{ } \odot + 0.25 \text{ c. ax. } 90^\circ = \frac{20}{xx}$.

Double images were induced and maintained by the above described simple method after a few trials. R. *Hyperphoria* = $3\frac{1}{2}^\circ$; exoph. far and near, in great and varying degree. After a confirmation of this diagnosis, tenotomy of R. sup. rectus was performed. The entire tendon was divided, as *no appreciable modification of the hyperphoria followed partial division.* None of the neighboring attachments was severed. The immediate result was: L. *Hyperphoria* = 4° . Result in nine weeks—orthophoria far, exophoria near = 12° ; in six months—

tendency—a subnormal nervous power and force, whatever name be given to it. This is the underlying, predisposing cause. Accommodative asthenopia *and* neurotic tendency are responsible for the nervous manifestation. This is no theory. It is daily proved in practice. Many published and unpublished cases are in evidence to prove that refractive errors have been the disturbing cause in certain abnormal manifestations of the nervous system which resisted all treatment until ametropia was suspected and relieved. And if reflex symptoms are caused by prolonged, irregular, or excessive contraction of the ciliary muscle, and of the internal and external recti, may they not also be caused by the superior and inferior recti under similar conditions—assuming, in the latter case as in the former, the existence, either inherited or acquired, of a neurotic tendency or disposition upon which the superstructure of a specific or definite nervous disease may arise?

Muscular asthenopia is as familiar as accommodative. Thirty years ago, Von Graefe formulated laws for its diagnosis and treatment which guide us to-day, and while the terms employed by him—"insufficiency of the interni," "insufficiency of the externi"—have been replaced by shorter and more accurate designations, nothing really new has been added to our knowledge. This cannot be truly said of the relation of the vertical muscles with each other and with the lateral muscles. Stevens has contributed to the science of ophthalmology the valuable results of his studies and investigations; and if their importance and application have a narrower range than he claims for them, experienced and fair-minded men will not be slow, on that account, to accord him due credit for his contributions to this branch of scientific medicine.

The first two cases recorded below are not illustrations of hyperphoria, and perhaps should be excluded from the paper, but as their histories and symptoms are identical with typical cases of hyperphoria as described by Stevens, and yet showed vertical muscular equilibrium, their recital is, I think, consistent and profitable.

CASE I.—Miss N., aged twenty-five, complained of constant headache, which was aggravated by the near use of the eyes. She was obliged to give up her work, the making of artificial teeth, on account of her great distress. She had no constitutional ailment, and but for her headache, which she believed to be ocular, would have been entirely well. Under a mydriatic (dubosia) her refraction was: R. $+ 0.75c.$ ax. $90^\circ = \frac{xx}{20}$. L. $+ 0.75c.$ ax. 90° .

This correction was ordered for constant use. After several weeks there was no relief from headache, nor increase of ability to work. In examination for muscular anomalies, "insuf. of int. rect." = 6° far, 12° near, was found. Prism 3° base in O. U. gave temporary relief. Later, partial tenotomy of ext. recti. Immediately afterward: Esoph. far = 4° ; Exoph. near = 4° . In a few days: Exoph. far = 1° , near = 10° .

The vertical displacement was entirely corrected. The *lateral disappeared*, and Exoph. near = 3° . 29th (three days later), she "has had no double vision; *I cannot induce diplopia without a prism.*" Exoph. far = 2, near = 4; no vertical deviation. $3d: V. = \frac{20}{XX}$. Orthophoria far;

Exoph. near = 3° ; add. = 20° , abd. = 8° ; circum. = 3° . 12th: Occasional double V. L. Hyperphoria = 1° . In induced vertical diplopia L. light (eye) wanders to R. and L., as before, according to distance; abd. = 7° , add. = 32° . Ordered prism 1° base up L. 24th: Double V. on lying down. Complained of malaise; fainted a few days ago, no headache unless she reads, and then it comes on in a very few minutes. Esoph. far = 3° ; Exoph. near = 4° . L. Hyperphoria = 1° . 2d: R. inf. rect. divided partially. Immediately afterward: R. Hyperphoria = 1° . 3d: Orthophoria. 12th: Double V. when recumbent. R. Hyperphoria = $\frac{1}{2}^{\circ}$; no lateral deviation; add. = 20° , abd. = 10° ; circum. = 3° . Asthenopia has disappeared. "Read one hour by artificial light without discomfort." This satisfactory condition has remained unchanged, but it was found at the last examination, made three months after the tenotomy, that Miss H. had diplopia in *every direction*, at the extreme limits of the common field of V. This cannot be ascribed to a want of equilibrium of any one set of muscles, but rather to deficiency of power of all the muscles.

The final result is doubtful. The benefit from the operative procedures was relief from annoying double V., and ability to read a desirable length of time with comfort.

CASE VI.—Mrs. H., aged forty-seven, sent to me by Dr. R. R. Bunting, Roxborough, Philadelphia. For many years she had suffered headache severe enough to require a day's rest in bed, after using the eyes for reading or sewing only a short time, and after physical exertion. It always followed a day's shopping, an evening at theatre, a long walk, or any unusual excitement. Her nervous system was exhausted. She had so-called nervous prostration, and had almost resigned herself to invalidism. I examined her in December, 1884, for refractive error.

She was wearing R. + 1.25c. ax. 180° , L. + 1s, for near use, which helped but did not relieve her asthenopia. I found, under dubosia: R. + 2c. ax. $175^{\circ} = \frac{20}{XX}$. L. + 0.25 \odot 0.25c. ax. $180^{\circ} = \frac{20}{XX}$,

and ordered it for constant use. Eighteen months later + 0.5s. was added for presbyopia. With these two pairs of glasses Mrs. H. was enabled to use her eyes better than with the first pair, yet they were unsatisfactory. Her V. was improved, *but she could not wear the glasses constantly*. The dizziness and headache were no better. Mrs. H. continued to suffer until March, 1890, when she consulted me again, at my request, to determine the presence or absence of any muscular anomaly by means of the phorometer, which I had not used in previous examinations. I found the above refraction slightly modified: R. + 2c. ax. $175^{\circ} = \frac{20}{XX}$. L. + 5c. ax. $180^{\circ} = \frac{20}{XX}$. With, and without, this cor-

rection, in repeated tests, R. *hyperphoria* = 2° was determined. Esoph. far = 2° ; Exoph. near = 1° ; abd. = 6° , add. = 2° . Sup. rect. R. (and inf. rect. L.) overcomes 3° . Sup. rect. L. (and inf. rect. R.) overcomes only 1° . April 1st: Total division tendon sup. rect. R. Immediate

orthophoria far, esophoria near = 8; add. = 30, abd. = 10. Complete relief of all asthenopic symptoms, and a decided subsidence of the severe nervous conditions, followed within a few days after operation. She enjoyed absolute freedom from pain, and the power of prolonged use of her eyes in near vision was reestablished. The hyperphoria was removed, and the exophoria, which before the tenotomy was very high, became esophoria. I advised no further treatment, believing that with the lapse of a longer period of time lateral muscular equilibrium would be established. The slight refractive error was not corrected. In this case the hyperphoria was the dominant element of disturbance, and complete success followed its removal.

CASE V.—Miss H., aged eighteen, Wilmington, Del., a stout, fully developed, and fine-looking girl, but with evidences of a lack of muscular tonicity and of anæmia; ears and lips pale, localized anæsthesia of the skin. She complained of constant headache, increased by the slightest use of the eyes at the near point, occasional *double vision*, and general nervous exhaustion. The diplopia was a prominent but not constant symptom, and included both near and distant objects. It was easily induced without prisms and persisted sufficiently long to permit a thorough examination.

This case is typical. First: on account of the absence almost of converging power without divergence. This was shown by the varying position of the false image and the changing relation of the false and true images. After having induced diplopia, without prisms, in testing with candle at 20', the image seen by the L. eye was lower (L. hyperphoria) and to L. side (homonymous); at 18' it began to wander to the right, was lower, but did not fuse with, or at any time remain stationary under the other; inside of 18' it was crossed and lower. The degree of deviation increased inversely as the distance. Throughout all the tests the image seen by the L. eye was always lower than that seen by the R.; *i. e.*, L. hyperphoria = 2-3° persisted as a constant condition; Esoph. far = 2°; Exoph. near = 15°.

Second: Stevens calls attention to the amblyopia which is frequently present in one or both eyes in hyperphoria. In Miss H.'s case V. on first examination was $\frac{20}{XL}$; no lesion of media or fundus. (Dubosia) R.

+ 0.75c. ax. 90° = $\frac{20}{XXX}$. L. + 0.75c. ax. 90° = $\frac{20}{XL}$. With this correction, and during paralysis of accommodation, vision equalled only two-thirds of the normal in the R., which was considered by me as the better or fixing eye.

After consultation with Dr. William Thomson, Miss H. was taken from school, ordered tonic remedies, nourishing diet, and exercise in the open air. After one month's treatment, the only improvement was in V., R. $\frac{20}{XXX}$, L. $\frac{20}{XXX}$, probably brought about by wearing the astigmatic correction. The faulty action of the muscles was unchanged. With Dr. Thomson's approval, and with his assistance, I divided the tendon of the L. sup. rect. in the middle, leaving the edges intact, being guided in the extent of the cutting by the phorometer. After several interruptions for testing the effect, orthophoria for distance was obtained.

The vertical displacement was entirely corrected. The *lateral displacement*, and Exoph. near = 3° . 29th (three days later), she "has had no double vision; *I cannot induce diplopia without a prism.*" Exoph. far = 2, near = 4; no vertical deviation. $3d: V. = \frac{20}{xx}$. Orthophoria far;

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result was: L. Hyperphoria = $1\frac{1}{2}^{\circ}$. 5th: L. Hyperphoria = 3° . 13th: No hyperphoria. Exoph. far = 5° ; orthophoria near. Mrs. H. reports that she is certainly relieved of headache, can sew, read, shop, or exercise with no bad result. There was, six months later, no return of asthenopia, and general health decidedly improved. *She wears distant glass constantly.*

This case illustrates a point which has not received sufficient attention. Mrs. H. found it impossible to wear her astigmatic correction before operation; afterward she found it equally impossible to go without it. The explanation is not far to seek. Before the tenotomy, with her refractive error corrected, images were distinctly formed on each retina, and it required constant contraction on the part of the R. inf. rect. to prevent distressing, because distinct, double V. Without the correction, the indistinct blurred image of the R. was suppressed, or at least was not disturbing. After tenotomy the visual axes were parallel, and the eyes required lenses that made the images of equal size and clearness, since they fell on corresponding points on the retina.

The result of the tenotomy was an unqualified success, both in respect of its effect on the power to use the eyes without pain and upon the reflex symptoms.

Method of Operating.—Stevens has suggested special instruments, differing principally in size from those in use in strabismus operations. He advises a division of the tendon, either partial or complete, according to the degree of hyperphoria, and to stop the section where the axes of V. are on one horizontal plane. My own experience, limited as it is, does not confirm this teaching. How can orthophoria obtained immediately after a tenotomy be retained? Is it practicable or in accordance with the laws of pathology to suppose that no union of the divided structures will take place, and that the orthophoria will remain as a permanent condition?

The operator must determine in each case how much effect he should obtain, and no general law can be formulated which shall cover all cases. In my own operations I have aimed to produce an opposite hyperphoria equal in degree to the original, and have succeeded fairly well, with one exception, which I afterward regretted, since a second operation became necessary.

Is there a latent hyperphoria? It seems impossible to determine its existence before operating, and our only safeguard is repeated and thorough examinations, allowing the muscles ample time to fall into that pathological position which is one of rest for them. That the total deviation is not ascertained before tenotomy, is proved by the subsequent history of a case operated on by Dr. Wm. Thomson.

Should, then, the tenotomy be partial, or complete? And, Can hyperphoria, with its array of reflex symptoms, be cured by a tenotomy

limited to the centre of the tendon? I confess the results secured by others have not been attainable in my own experience. I have divided, in a number of instances, other than those here recorded, the centre of the tendon, leaving its edges and attachments to the capsule intact, but without effect. A measurable displacement of the image followed only when I had made a complete section.

It is important to determine which eye shall be chosen for operation. It must not be forgotten that functional hyper-, as well as eso- and exophoria, is an affection of two eyes and two or more muscles, and not of one eye or one muscle only. Other than muscular conditions may decide which is the weaker or stronger eye, and which muscle may with the greater benefit be cut—such as relative position and instability of one image, error of refraction, and inclination of the head. If there be no reason to suppose one eye more at fault than its fellow, the tenotomy may be divided between the sup. rect. of one and the inf. rect. of the other eye.

CONCLUSIONS :

That hyperphoria is a real affection, and that, while it may exist without causing symptoms, it is in some cases of the highest importance.

That it may produce reflex disturbances in an over-sensitive or exhausted system.

That reflex functional disorders are found in patients with hyperphoria, which are not caused by hyperphoria.

That it is not dependent upon errors of refraction.

That it should be sought for in every case of asthenopia.

That the degree can be determined only after repeated examinations.

That tenotomy, and not prisms, is the treatment for hyperphoria.

That in most cases the tendon should be completely divided.

Of the six cases reported above, two presented symptoms of hyperphoria when no want of equilibrium of the vertical muscles could be detected; one had hyperphoria with asthenopia, which was entirely relieved by the correction of the refractive error. Three had local and reflex symptoms due to hyperphoria, and were cured by tenotomies.

It may be objected that the cases are too few to enable one to deduce therefrom laws for general acceptance. No such deductions are made. Nothing more has been attempted than a truthful recital of the histories and a careful observation of the points presented to my own mind. They furnish so much data from which the reader may form his own opinion and draw his own deductions. The subject is new, attractive, and important, and deserves more impartial investigation and study than it has hitherto received.

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auricle filled up with cotton-wool, and pressure applied by a suitably arranged bandage, preferably by circular turns over the head." Subsequent management must be in accordance with surgical rules as occasion demands. Massage of the auricle is recommended if there is a tendency to hyperplasia and deformity: by this means the extravasated and inflammatory products are absorbed. Then follows a discussion of herpes, eczema, and various other cutaneous affections of the auricle.

Inflammation of the soft structures of the external auditory canal receives a careful explanation, and here we note new matter on the subject of aspergillus in the ear, not found in the first edition.

In the treatment of boils in the ear, in the early and painful stage, the author employs locally one-sixth grain of liquid extract of opium, and one-twelfth grain of hydrochlorate of morphine, in gelatin ovoid capsules. Before these are applied, the ear is washed out with a warm four per cent. solution of carbolic acid. Sometimes only one application a day is required; in others, three or four. The effect of this treatment is said to be partly anæsthetic and partly antiphlogistic. If pus has formed, this treatment is not as efficacious as before maturation has occurred. "Such good results are obtained from this mode of treatment that the author no longer practises scarification, as was previously done almost without exception in the stage of hyperæmia before the establishment of suppuration." This latter course has been almost entirely abandoned by American aurists, for the last ten years, in treating furuncles in the ear, while, in the hyperæmic stage, emollient instillations have taken its place.

Diffuse inflammation of the skin of the auditory canal receives ample attention. The treatment is similar to that employed in the circumscribed form.

Affections of the membrana tympani receive consideration under the headings Injuries, Myringitis, acute and chronic, and Permanent Apertures, with the application of the artificial drum membrane; and Thickening in all its varied forms.

New formations in the external auditory canal, and foreign bodies in the canal, claim the rest of the part devoted to diseases of the external ear.

Diseases of the middle ear are classified under—(1) Exudative, and (2) Plastic Inflammation of the Middle Ear. In the former the exudative element is predominant; in the latter, the inflammatory new formation. The first class is subdivided into (*a*) catarrhal, (*b*) purulent, (*c*) croupous—croupous exudation on the surface of the mucous membrane, and (*d*) diphtheritic—croupous exudation with interstitial infiltration of the structure.

Catarrh of the middle ear arises either primarily from meteorological or telluric conditions not fully explained, or, as is most common, it originates from a catarrh in a contiguous structure, especially the nasopharynx. It usually occurs on both sides, either simultaneously or at a short interval. If the latter, the left ear is usually first affected and suffers the most. When unilateral, the disease is usually on the left side. Certain diatheses, like struma, syphilis, tubercle, which predispose to affections of the mucous membranes, favor the establishment of catarrh of the middle ear. As is well known, the acute exanthemata contribute largely to this form of ear disease, while typhoid fever, pneumonia, puerperal fever, and inflammations of the buccal mucous mem-

REVIEWS.

A TEXT-BOOK OF THE DISEASES OF THE EAR. By DR. JOSEF GRUBER, Professor of Otology in the Imperial Royal University of Vienna, etc. Translated from the second German edition by special permission of the Author, and edited by EDWARD LAW, M.D.C.M. EDIN., M.R.C.S. ENG., and by COLEMAN JEWELL, M.B. LOND., M.R.C.S. ENG. With 150 illustrations and seventy colored figures on two lithographic plates. London : H. K. Lewis, 1890.

THE author says in his preface : "The great advance which has taken place in the theory and practice of otology during the last ten years, imposes upon the teacher of this branch of medicine a task no longer possible to accomplish within the short space of time which it is customary to devote to it in the ordinary medical curriculum. This being the case, it must rest with private study to supply the unavoidable deficiencies left in this department."

The author is wise in arranging the study of the ear and its diseases by a preliminary description of the anatomy of the entire organ of hearing, preferring to thus give an idea of the anatomy as a whole, rather than to consider the structure of a part of the ear and then its diseases, as the latter course is unnatural and likely to lead to a disjointed knowledge. Therefore, the first one hundred and seventeen pages of this work are given up to the anatomy of the ear in all its minutiae. The rest of the five hundred and eighty pages of the book are given up to a consideration of the various diseases of the ear and an excellent index of authors and subjects; the latter comprising about sixteen pages. One hundred and twenty-three pages are given to diseases of the external ear, including those of the membrana tympani. One hundred and fifty-eight pages are devoted to diseases of the middle ear and their treatment.

The rest of the treatise furnishes an interesting consideration of the diseases of the internal ear and auditory nerve, in sixty-two pages.

On page 213 we notice an account of a case of rudimentary auricles and deficient development of the right side of the face and scalp, not found in the first edition of this work. An exploratory operation revealed the fact that the external osseous canal did not exist. The disfiguring projecting auricle was amputated and an artificial one worn in its place. Burns, scalds, frost-bites, and othæmatoma are then considered. In the treatment of the latter, "evacuation of the extravasated blood as quickly as possible, the prevention of a fresh effusion, and the union by adhesion of the separated structures by means of properly adapted pressure," is the course recommended. "The evacuation should be done with a small aspirator. If coagulation has taken place, the clot should be removed through an incision, the depressions of the

The prognosis is held to be, "upon the whole, unfavorable, especially when the mucous membrane, or the inner wall of the tympanum over the fenestra ovalis and fenestra rotunda, is involved in the process."

The treatment has for its objects the "checking of the morbid process and the relief of the injurious results of the hyperplasia, so far as these may be possible."

It is in this form of chronic catarrh of the middle ear that the aurist encounters the bitter complaints of his patients, of tinnitus aurium, vertigo, and deafness, from the retraction of the membrana tympani and ossicles of hearing, induced by the sclerosis of the mucous covering of the ossicles, and their consequent ankylosis. The author offers, practically, very little for their relief, and we are amazed to find no allusion to the good results obtained by others in just such cases, by excision of the stiffened membrana tympani and ossicles. In some instances entire relief from tinnitus and vertigo has been afforded by this operation when *all* other means have failed. But, the author appears ignorant of what has been thus accomplished by others.

The author advocates, however, tenotomy of the tensor tympani, if it appears that retraction of that muscle is the cause of tinnitus and vertigo. He regards tenotomy of the stapedius muscle as a doubtful remedy for relief of diminished mobility of the stapes. The treatment of polypus from the ear is based upon the two cardinal principles common to all surgical practice, viz.: the removal of the new-growth, and the prevention of a recurrence.

Inflammation of the periosteum of the mastoid region receives a short chapter, in which it is considered under two forms, the primary and secondary. The first is of very rare occurrence; the second is very frequent in connection with inflammatory processes of the aural structures. Caries and necrosis of the temporal bone and of the auditory ossicles receive attention in a chapter of twenty pages, but the treatment seems to us very meagre and inadequate, though the description of the diseases and symptoms is most complete, and to an aurist very interesting. We have again to comment on the silence of the author upon excision of the diseased membrana and necrosed ossicles in chronic purulency, and the great advantages gained thereby.

The truth is, the operation of excision is so painful that it demands etherization of the patient. But, unless his ear is then illuminated by an electric head-lamp, devised for the purpose, the operation cannot be safely carried out; and, so far as we are aware, the only thoroughly useful electric lamp for this purpose is of American make, and, apparently, has not yet been imported into Germany.

Time and space cannot be given here to as long a consideration of diseases of the internal ear and auditory nerve as they deserve. Though Ménière's disease is still so called, a name which we hope to see supplanted some day by the just title of aural vertigo, we are glad to note that the author mentions the fact that even Ménière did not claim that this disease is necessarily always due to primary changes in the semi-circular canals, "but that pathological processes in the middle ear, so far as they are capable of injurious influence upon the labyrinth, may likewise evoke phenomena of this order."

The entire treatise of Gruber impresses one as the work of a man imbued with a profound scientific spirit, even if some of the treatment is

brane, induce their share of aural catarrhs. The symptomatology of this disease of the ear is given most extensively, the author evidently placing great reliance in diagnosis upon auscultation of the ear under the effects of inflation.

Under treatment, after the relief of the more urgent symptoms, pain and deafness, the author dwells very wisely on the condition and treatment of the naso-pharynx. "The use of the vesicants and irritating ointments to the skin in the region of the ear, so much prized by the public, is without any effect in middle-ear catarrh."

Acute purulent inflammation of the middle ear occurs either in an ear previously free from inflammation, or it is developed as an exacerbation of an exciting catarrhal process. It is nearly always unilateral, and is as common on one side as the other. The causes of catarrh of the middle ear may also produce purulent otitis media. In the latter, however, microorganisms appear to play an important part, as in an otitis occurring in pneumonia. Traumatic influences, such as the entrance of fluid through the Eustachian tube in using the nasal douche, favor the development of purulent otitis media. So, also, plugging the nose for epistaxis, from the consequent irritation of the naso-pharynx may induce purulency of the middle ear, as also may the presence of a foreign body in the external ear. Amongst the general diseases productive at times of purulent inflammation of the middle ear, may be named the exanthemata as the most prominent, then tubercle, typhoid fever, recurrent fever, syphilis, puerperal affections, Bright's disease, pneumonia, ulcerative endocarditis, etc. "*Otitis media suppurativa is notably a febrile disease, unlike the catarrhal affection.*" In this form of aural inflammation the phenomena, at its outset, relate to disturbances of the nerves of sensation, so that here we find the excruciating and continuous, piercing, and tearing pain in the ear, known as "ear-ache." In children this not uncommonly induces vomiting, or stupor, coma, and muscular spasms, and even epileptiform seizures. The author then considers the treatment of the disease, and also the course it may take if unchecked. The mastoid cells and their outer covering may be attacked, or the disease may invade the cerebral cavity through various natural channels, or anomalous openings in the petrous bone.

In regard to the prognosis of this disease, so far as concerns its inward extension, it is more favorable in childhood and old age than in the intermediate portion of life. This, the author says, is due to the fact that in childhood the sigmoid sinus, through which the morbid process usually passes to the brain, is separated from its mastoid cells by a much thicker barrier of bone than in adult life, and in old age these cells become obliterated by osseous solidification to some extent, and the extension of aural disease to the mastoid and cerebral cavities is rendered less likely. The treatment set forth is most judicious and extensive, planned so as to meet all indications. Of course, the most complete drainage must be maintained. In cleansing a purulent ear, syringing must not be supplanted by mopping with cotton. The author advocates in some cases aspiration of the drum-cavity by means of Siegle's pneumatic speculum, when syringing is not sufficient to cleanse the depths of the cavity. Amongst local applications in otorrhœa finely powdered boric acid is placed in the front rank.

Plastic inflammation of the middle ear, hypertrophic or sclerotic catarrh, is considered rather too briefly for so important an ear disease.

haps, it would be better to say that the method of treating them has changed, and is still in process of evolution. This fact is manifested in the diminished space, relative to similar works of equal magnitude, which the author gives to the classification and treatment of these disorders, especially their treatment by pessaries. The pessary seldom cures, and is often a great nuisance. At present there seems to be no alternative to such treatment but cutting operations. Of these there is a sufficient variety, but their very abundance is sometimes an embarrassment, and not one of them can be relied upon to give uniformly good results. Some of them need only be mentioned to call forth insuperable objections. It would seem unnecessary to comment in detail upon the numerous excellences of the work. There is a notable and refreshing absence of excessive refinement in classification, which, with most minds, tends to confusion. The subject of pelvic inflammation, that old bugbear, is intelligently discussed in the light of modern, that is, recent surgical experience, and while this method does not give us all needed information, it is better than the method of the deadhouse alone, or the method of palpation. In connection with this subject we observe one statement with which we cannot agree, namely, that ovaritis cannot exist without an antecedent endometritis and salpingitis; that is, that we have no simple lesion *ovaritis*, but always a mixed one, *tubo-ovaritis*. Now, we believe it is not very unusual for ovaritis to exist alone, especially in connection with disturbances of the utero-ovarian bloodvessels. This may or may not be connected with menstruation and menstrual disorders, and this statement is made, not as a matter of theory, but of experience. A criticism of the arrangement of subjects in this work would be but an expression of opinion. We confess a preference for such an arrangement as is found in Thomas, and some other works of equally high degree of excellence, fundamental considerations of anatomy and pathology taking the lead, and consideration of parts and organs, from without inward, following. Such an arrangement seems to us the natural one, and obviates repetition, at least to a considerable degree. But failure to follow such a plan is a minor defect, if, indeed, it is a defect. On the whole, the work is, as we stated at the beginning, a very meritorious one, and highly creditable to its distinguished author.

A. F. C.

A PRACTICAL TREATISE ON IMPOTENCE, STERILITY, AND ALLIED DISORDERS OF THE MALE SEXUAL ORGANS. By SAMUEL W. GROSS, A.M., M.D., LL.D., Professor of the Principles of Surgery and Clinical Surgery in the Jefferson Medical College of Philadelphia, etc. Fourth edition. Revised by F. R. STURGIS, M.D. Pp. 169. Philadelphia: Lea Brothers & Co., 1890.

A TREATISE which, after achieving three issues from the press, and a translation into the Russian tongue, appears in a fourth edition after revision, is certainly entitled to respect, and, in a qualified sense, to some concession of authority. The several pages of this small work are fairly well known to the profession at large, and scarcely call for further extended notice. The several chapters on atonic, psychical, and symptomatic impotence, have been made familiar, not merely to the practitioner and student, but to not a few of the anxious among the profane.

rather too conservative and antiquated. His translators have done their work into acceptable English, and the publisher has given the reader a book attractive in every way.

C. H. B.

TRAITÉ DE GYNÉCOLOGIE CLINIQUE ET OPERATOIRE. Par S. POZZI, Professeur agrégé à Faculté de Médecine, Chirurgien de l'Hôpital Lourcine-Pascal. Pp. xxiv., 1154. Paris, 1890.

A TREATISE UPON CLINICAL AND OPERATIVE GYNECOLOGY. By S. POZZI, M.D., etc. Paris, 1890.

WE are not aware of any more scholarly, comprehensive, or intelligible treatise upon gynæcology in the history of its literature. Gynecology is a subject which has developed so rapidly, and in so many directions, that to attempt to write a record of this progress, and at the same time accumulate a large individual experience, is a task which few men in the future will attempt. Monographs, and series of lectures, and encyclopædias, will probably form the future literature of this subject. The tendency of gynecology at the present time is mainly surgical. This tendency is well marked in the work under consideration. If it had introduced propositions which seem audacious to those who believe that very many of the ills peculiar to women can be cured by drugs, its defence is logical that there will be a great saving of time in some cases, that life itself will be saved in others, and that if surgery fails other means may still be resorted to. Of course, it is admitted that the so-called risks of surgical measures are often greater than those of medical ones, but it is assumed that the gains will also be greater.

The author states that his experience and observation have not been limited to his own country. This is obvious from the enormous mass of literature, foreign as well as home, to which he refers, and with a fairness and frankness which are quite too infrequent among French and German authors. It is a great satisfaction to find a Continental author who is free from that narrowness and provincialism which sees no virtue beyond the border-lines of its own territory. There is but one subject in the wide range of gynecology, so far as we can recall, which the author has not touched and illuminated, with that clearness of expression for which the French language and manner of thought are so well adapted. That subject is the diseases of the mammary glands, which are as essential a portion of the reproductive apparatus in woman as the organs of the pelvis. They certainly are as deserving of attention by systematic writers as the diseases and injuries of the bladder, and no one should think of writing a treatise on gynecology and omitting them. The work abounds in plates and figures, many of which are peculiar to it, and are well executed, and clear in their teaching. The value of good plates cannot be overestimated in such a work. The pathology is written, of course, from a French and not a German standpoint, and the two do not always harmonize. The views of German pathologists are referred to, however, without apparent prejudice.

One fact, which must have been remarked by any thoughtful gynecologist, is the diminished importance which uterine displacements *per se* have occupied in pelvic pathology within the past five years; or, per-

authors and editors how to deliver themselves acceptably on any theme, and yet Macaulay, one of the ablest of reviewers, did not hesitate in such a course. If one were ever tempted to follow such bold steps it might be in connection with a subject that is an ancient accretion of prejudice, lust, greed, fear, and ignorance. And yet it is a subject which should be approached by an author, as the sunshine falls upon a heap of ordure, in a spirit of sympathy, fearlessness, candor, sincerity, and truth. Surely he should devote some space to the physiology of the male sexual organs, not merely in their narrow functions, but in their broader relationship to the general economy, to the product of conception, and, both as to their activities and anatomical details, to the not dissimilar organs of the other sex. He should set in evidence the incontrovertible fact that the generative apparatus of the male, after half a century of complete disuse, may be capable of procreation, as also the equally established fact that it may accomplish the same end after a similar lapse of time in the face of the most persistent and frightful abuse. The wonderfully planned conservation of its power, under the jealous protectorate of the recuperative energy of the body, in both health and disease, in precocious development and tardy decline, should be well understood by him who resorts to a therapeutic measure or a surgical mutilation. With this it should be demonstrated clearly that the procreative is far from holding the preëminent place among the powers of the body, being often preserved in the fullest measure by the tuberculous, the syphilitic, and the idiotic; that it is often most successfully active in those periods of human life when the best powers of a man are actually immature; and that it may be wholly wanting, or but very feebly developed, in individuals who physically represent the grandest and noblest types of the sex. He should be able to prove rigorously that the words "potent" and "impotent," in the sense of their common usage, have no meaning whatever for the expert, and express chiefly the erroneous concepts of those who employ them, the majority of healthy men being both potent and impotent in this false sense; and, given a fixed moment and certain conditions, the average man will be "potent" or impotent, according as a thousand factors may operate in the one direction or the other. He should show that the human like the other animal brutes (as, for example, in the type of the North American savage), may, indeed, at all times be competent to effect a rape at will, but that the "civilized" man, even when governed by immoderate lust, and possessed of unusual vigor, is often "impotent" in conditions of health. He should be able to demonstrate that there is a prostatic no less than a uterine "flood and ebb," in each month, of sexual congestion and its reverse, and point out the fact that as women are distinguished from the females of all other animals (in generations of transmitted inheritance), by a menstruation which may be described as the price of virginity and chastity, so the "spermatorrhœa" of the male may be a condition of his clean living; and that even when his losses at night occur "without erections and dreams," he is in no danger of touching that "pathological" state described by our author (without correction) in the revised edition before us (p. 135).

With these and other allied facts fully explained, the reader of a text-book would be in position to begin, without prejudice, the study of the perversions and partial or total suspension of the sexual power in men who have never had a stricture of the urethra. Yet, even here, he

Sterility, spermatorrhœa, and prostaticorrhœa, as here expounded, are the data of andrology for some who are not merely of the initiated, but of the curious. Much that is here set down is clearly expressed, based upon creditable observation and authority, and illustrated by trustworthy clinical fact. Some of the injunctions are wise, and of practical worth. The book itself represents no light labor of collation and an abundant experience.

None the less, one can scarcely read a half-dozen of its pages without being convinced that the mental vision of the lamented author was unfortunately distorted by certain obstinate opacities that lay in its field. He honestly believed and taught that the practice of masturbation, not in a few isolated and singular instances, but in many, if not the majority, of its youthful victims, was effective in the production of stricture of the urethra. Acting upon this conviction, he explored, distended, divided, and otherwise treated the urethra of a large number of young men who had never contracted a blennorrhagia, but whose troubles he thought sprang from local mischief in these parts. Impressed with this conviction, not shared by the greater number of authors upon this subject, he wrote the treatise before us.

In describing atonic impotence (Cases I.—V., p. 24), he recognizes a "stricture" in each of five young men, "in whom the idea of gonorrhœa must be discarded." In treating of organic aspermatism, he cites the case of a man with no history of gonorrhœa, in whose urethra he found a "stricture" (Case XXVI., p. 119). In describing atonic aspermatism, he relates the case of a man suffering from "stricture," who gives no history of gonorrhœa (Case XXIX., p. 123). In connection with the subject of nocturnal pollutions he relates the case of an adult male, virgin of all sexual indulgence, affected with a "stricture" (Case XXXI., p. 134). In discussing diurnal pollutions he relates the case of a patient, no gonorrhœal antecedents recorded, affected with a "stricture" (Case XXIV., p. 137). In the pages devoted to prostaticorrhœa, "in its pure form," as displayed in twenty-one subjects, he states that, of these, nineteen had "stricture of the urethra" (p. 162).

It is as impossible for one to read these pages and accept their deductions, without questioning their premises, as it was for the author himself to put his thoughts on paper before they had been filtered through and colored by his unfortunate convictions.

The reviser of the present edition is quite competent to view these subjects with an unprejudiced eye, and to write upon them with clearness, vigor, and authority. But, in the present case, he has contented himself with the expression of his personal dissent or correction in the compass of paragraphs which appear scattered here and there along the pages, as they seemed to him to be required. The first emphasizes the propriety of a divorce between impotence and sterility, and is soon followed by another (p. 22), denying that confirmed masturbation and gleet are equally sure to result in stricture, with a suggestive hint that the arrest of a bulbous bougie, "even of small size," when traversing the urethra, is not evidence of a "true stricture." In this way, as page succeeds page, he amends or adds to the conclusions of the text. The result as a whole is unsatisfactory and feeble. The revision would have been far more acceptable to both the reviser and his readers if Dr. Sturgis had rewritten the entire book.

It is scarcely within the province of the reviewer to suggest to

much more importance. Three divisions of chronic vertigo are commonly recognized: first, epileptic vertigo; second, sensorial vertigo, and especially auricular vertigo (Ménière's disease); and third, gastric vertigo. To these the author, following Huchard, would add cardiovascular vertigo, or the vertigo of arterial sclerosis, which he believes has not received proper recognition from clinicians in general.

Arterial sclerosis, he says, is a general and chronic disease of the entire arterial system, which, while it affects the whole of that system, may present more marked localization in different organs. Arterio-sclerosis is not to be identified with atheroma, the latter being but one of its manifestations, just as others are to be found in Bright's disease and cerebral softening.

Among the causes of arterial sclerosis, he enumerates chronic rheumatism, gout, diabetes, asthma, migraine, lithiasis, obesity, and other disturbances of innervation and nutrition, alcoholism, lead-poisoning, tobacco-poisoning, impaludism, syphilis, and infectious maladies in general. As a rule, he thinks that no one of these causes alone produces it, but that it is the resultant of several coöperating chronic intoxications. He endorses the theory of Huchard, that the arteritis, which is the anatomical basis of arterial sclerosis, results from inflammation consequent upon repeated spasms of the arterioles due to the irritation of toxic agents circulating in the blood. The particular effect of these spasms is a condition of hyper-tension of the arteries, which thus becomes of importance as an early diagnostic indication. The most important physical sign of this condition is the accentuation of the diastolic or closure sound in the aortic region. Among the important symptoms to which it gives rise is vertigo, the character of which varies with the localization of the lesion in the nervous system. We have simple vertigo, vertigo with epileptiform crises, or vertigo with permanently slow pulse, associated with epileptiform attacks or with frequent syncope. In particular the latter form, ascribed by Charcot and his pupils to bulbar lesion, the author, following Huchard, insists upon as a symptom of arterio-sclerosis, with, perhaps, special localization of lesions, both in the heart and in the medulla.

In treatment, two agents are especially applicable—sodium iodide and trinitrin (nitroglycerin); the indications for which are self-evident. When epileptiform crises accompany the vertigo, sodium bromide may be added to the treatment; and when nutrition is specially at fault, sodium arseniate is advised.

With the etiologic, pathologic, diagnostic, and therapeutic observations and arguments here advanced, the profession in America has for some time been familiar through the teachings of Bartholow.

S. S. C.

should be led, further, to the far more interesting field where accurately localized organic changes in the sexual tract are responsible for such results, the changes themselves being, however, as a rule, of far more consequence in many ways than in relation merely to the minor consequence of "impotence" or "sterility." Tuberculosis of these organs, for example, is a subject of vast importance, our knowledge of it increasing with every month, under the impulse of the painstaking efforts of indefatigable research. It probably, even when most insidious of evolution, first attacks the prostate gland, and many of the poorly described diseases of the prostate in persons virgin of venereal antecedents are instances of its interference with the functions of that organ. Yet, in the present treatise, no attention is given to its influence in discussing the etiology of spermatorrhœa (the word "tuberculosis" does not appear in the index), though there are few experts who have not examined cases of genuine spermatorrhœa, where semen was regularly at certain hours of the day discharged with the urine, and where the whole mischief originated in a tuberculosis of the gland in question. In this same field of organic changes, again, one seeks to know more of the abnormal condition, known as "bloody semen," than can be compressed into the scanty paragraphs here devoted to the subject. One would like to know how to differentiate the bloody semen of prostatic origin from the more obstinate form due to blennorrhagic involvement of the seminal vesicles, and even to understand how to discover which vesicle is at fault, as well as to be fully instructed that even in the most obstinate cases this condition can be made to yield to that wherein a child may be procreated by the subject of the disease.

We look, indeed, to have a fuller and more useful edition of this treatise from the hand of the present reviser at no distant day—one that can be commended as worthy of the study of the practitioner who, if truth must be told, is too often so poorly informed of the diseases of his own sex that he can for the most part describe with greater accuracy those of women.

The publishers have done their part with unusual care, the proof-reading being remarkably accurate, and the typography all that can be desired.

J. N. H.

DU VERTIGE CARDIO-VASCULAIRE, OU VERTIGE DES ARTERIO-SCLEREUX,
PAR LE PROFESSEUR J. GRASSET: Leçons Recueillies et Publiées par le
DR. G. RAUZIER, Chef de Clinique Médicale. Montpellier: Camille Coulet,
Libraire-éditeur. Paris: George Masson, Libraire-éditeur, 1890.

ON CARDIO-VASCULAR VERTIGO, OR VERTIGO OF ARTERIO-SCLEROSIS.
By PROFESSOR J. GRASSET. Reported by DR. G. RAUZIER, Chief of the
Medical Clinic. 8vo., pp. 80. Montpellier and Paris, 1890.

THIS is quite a careful study of an important subject, and is enriched with some valuable sphygmographic tracings. The author believes that all species of vertigo should be grouped under two grand divisions: First, acute, or accidental vertigo, which may depend upon a great variety of causes; second, chronic, or habitual vertigo, which is of

framed on a different plan, but the meals of one day differ more or less from the corresponding meals of another day. We may be quite sure that this diversity serves some useful end. In drawing up schemes of diet we are not, therefore, justified in neglecting this feature and in reducing the diet-list to a dead level of monotonous uniformity. A want of attention to this point leads us unwittingly to needlessly torment and worry our patients by placing unnecessary restrictions on their choice of food. Some of those commonly imposed are difficult to understand. Most of them probably derive their origin from some crude notions floating through the lay press and unconsciously lodged in the medical mind. Why, for example, should tea and coffee be so frequently forbidden without any evidence that they disagree with the patient? or why should the bland, innocuous, and easily-digested potato be so ruthlessly proscribed? Sometimes prohibition takes a wider sweep, and fruit and vegetables are included in one general condemnation, nor are the rules laid down always self-consistent.

A good rule is to say to the patient, "Do you like it?" "Does it agree with you?" If the answer is in the affirmative there is no intelligible reason why the use of that article should not be sanctioned. Such a rule is so plain and simple, and so obviously consonant with good sense that it might scarcely appear worth while, or even dignified, to make formal mention of it, were it not so well established in the experience of all that it is constantly violated. The patient's instinct represents an immense accumulation of experience, partly acquired and partly inherited. It is, of course, not infallible—no instinct is; but so close and true are the sympathies of the palate with the stomach and the rest of the organism that its dictates are entitled to the utmost deference as those of the rightful authority in the choice of food.

A change of diet may often be of advantage to the patient. A course of two or three weeks of vegetarian regimen occasionally proves most grateful, especially in the case of heavy feeders. Similarly, the total abstinence from alcoholic beverages is often highly salutary, and most of all for those whose daily potations are on a liberal scale. Slight variations in the diet are often of advantage; thus, changes from tea to coffee or cocoa, from one kind of alcoholic beverage to another, from one sort of bread to another.

A change in the times of the meals is sometimes of benefit. In some cases troublesome insomnia may be relieved by changing from mid-day dinner to late dinner or substantial supper. Such effects are merely temporary, and their benefits are exhausted within a month or so, and then a return to the old diet or a new change may be desirable. A point of practical importance is that when certain articles disagree, it is better to lessen the quantity than to forbid; if fruit or vegetables prove difficult of digestion, it is unwise to prohibit them altogether. The antiscorbutic properties of fruit and vegetables cannot be safely foregone, and a very small proportion suffices to fulfil this indication. As regards potatoes, people do, no doubt, stuff their stomachs with potatoes, which the organ finds it difficult to deal with. But many persons cannot enjoy, or scarcely eat, their dinners without potatoes, and to abstain from them is a great privation. Nor is this necessary: a reduced allowance will solve the difficulty perfectly. Then, some persons are abnormally sensitive to tea or coffee or alcoholic beverages, and suffer discomfort from the quantities usually taken. But abnormal sensitiveness is not a proof

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF
FRANCIS H. WILLIAMS, M.D.,
ASSISTANT PROFESSOR OF THERAPEUTICS IN HARVARD UNIVERSITY.

HINTS ON DIETETICS.

SIR WILLIAM ROBERTS, who has devoted much attention to the subject of dietetics, has recently read before the Manchester Medical Society a communication on this subject.

He considers that the dietetic customs of civilized races suggest two distinct indications—one to subserve the needs of general nutrition, the other to subserve the needs of the higher functions of the brain and nervous system. It may be said that bread and other cereal articles, leguminous seeds, the various products of the dairy, fruits and vegetables, the harvest of the sea, and meat are designed to minister to the former purpose; and that tea, coffee, and the various forms of alcoholic beverages are designed to minister to the latter purpose. With this second group should also be classed tobacco; for, although tobacco cannot be regarded as a food, its use must be ranked with our dietetic customs. Strictly speaking meat, or at least some kinds of meat, should probably find a place in both categories, for it possesses certain stimulating properties which distinguish it from vegetable and dairy products. Tea and coffee and alcoholic beverages are sometimes branded as luxuries. What is a luxury? You cannot rightly class as luxuries—meaning thereby something that has no solid utility to the species—articles that are in general use among a successful and ascendant community. The very fact that they have attained this position is, to a naturalist, evidence sufficient that in some way or other the community as a whole, and in the long run, benefits by their use. The struggle for existence—or, rather, for a higher and better existence—among civilized men is almost exclusively a brain struggle; and these brain foods, as they have not inappropriately been termed, must be regarded as a very important part of the equipment for that struggle. One of the most characteristic features of our dietary is its variety or diversity. Not only are our several daily meals

TREATMENT OF INTERNAL HÆMORRHAGE.

DR JOHN FERGUSON has given a very good outline of some of the ways in which a practitioner may render aid to his patients in this emergency.

Among the remote ways of treating internal hæmorrhage are lowering the blood-pressure and changing the character of the blood itself. It is very apparent that the amount of blood that will flow through a rent in the wall of any vessel must be greatly influenced by the total amount of blood in the system and the amount of pressure upon the vessel from within. This being the case, the first step to take in dealing with a hæmorrhage is to cut off the supply of liquids. In this way the amount of blood is kept down, while it becomes thicker and better fitted for forming a good firm clot in the torn or ruptured vessel. Another step in the same direction is to reduce the volume of blood by actively eliminating water from the system. The hypodermic injection of pilocarpine rapidly unloads the body of water and inspissates the blood left behind, lessening thereby the freeness of the flow. This would not, however, be suitable in cases of pulmonary bleeding. Other diaphoretics might be selected, according to the judgment of the physician.

Those purgatives that produce copious watery stools, and at the same time are not irritating or depressing, must be placed high on the list of agents we may use for the relief of the sufferer entrusted to our charge. Of these purgatives there is none so good as Epsom salts. When given in saturated solution, without water, in free doses and often repeated, very free watery evacuations are produced, the amount of fluid in the vascular system is speedily lessened, and the hæmorrhage to this extent controlled. By maintaining this action for some time, the ruptured vessel has time to heal, because the pressure is largely taken off and it is put into the condition of rest. In addition to this the blood is thickened. In some cases of cholera—sporadic or epidemic—when the rice-water stools have been very abundant, the blood becomes so reduced in volume and so inspissated as not to flow from a wound made in a large vein. In the event of hæmorrhage due to ulceration in typhoid fever, this plan could not be had recourse to, though it might be used with advantage in the bleeding from a gastric ulcer. In the hæmorrhage, often so free, from soft and rapidly-growing uterine fibroids, it is specially useful if continued long enough—say for months.

In severe post-partum hæmorrhage the medical attendant may try ergotin hypodermically, or hot vaginal or rectal injections, but these may fail. It is a belief, not yet quite dead, that the uterine sinuses are closed by clots. This is quite erroneous. The uterine vessels and sinuses are interlaced by muscular fibres, and it is the contraction of these that arrests the hæmorrhage. This muscular tissue, as it were, ligates the vessels that would bleed, and, so long as the contraction is good, there is no danger. For the maintenance of this tonic action of the muscular tissue in the uterus the application of heat to the lumbar portion of the spine has been found very useful. It stimulates this portion of the nervous system by bringing more blood to it. There is a greater influx of nerve-energy to the uterus and contraction is brought about. It is true that the uterus seems to be very independent of the spinal cord, and labor may take place in a paraplegia. This does not, however, invalidate the fact that heat—applied to the spine by a sponge dipped into hot

that the incriminated article is unserviceable, and a diminution of the quantity may prove a better remedy than total prohibition.

Finally, Dr. Roberts adverts to the necessity for revision of the diet to meet those changes in the type of nutrition which naturally takes place as the individual travels on from youth to age. In the normal course the palate and the appetite adjust themselves automatically to these altered conditions, and there is a lessened intake of food, but sometimes these adjustments lag behind, and the power of taking food remains unaltered, while the assimilative powers are on the wane. Then some form of nutritive disorder necessarily follows. In most of these cases, but not in all, there is a tendency to stoutness. There are indications of digestive difficulties and of engorgement of the abdominal organs, and signs of that vague condition termed latent or undeveloped gout. The early recognition of this condition is very important, for thereupon depends the prevention or postponement of degenerative processes which hereafter prove formidable. In this conjuncture the observant medical adviser may render invaluable services in detecting the maladjustment and in taking timely steps for its correction. The most obvious indication is to lessen the quantity of food, and where difficulty is found in controlling the actual amount of food taken, where the appetite is yet strong and the powers of gastric digestion are abnormally active, the less concentrated forms of food are here a useful resource—green vegetables, salads, and thin soups—which help to fill the aching void without adding materially to the albuminoid and fatty ingredients of the meal. Tea and coffee are also serviceable in allaying an unseasonable craving for food. A stiff cup of tea or coffee shortly before dinner certainly takes the edge off a troublesome appetite. It is, however, well to proceed cautiously in this direction, for the promptings of nature are not to be lightly set aside. The effects of a contracted diet should be carefully and patiently watched with an open mind for every sign or suggestion, whether of warning to retreat, or of encouragement to advance. In middle life particular attention should be paid to the quantity of alcoholic beverages; as a very general rule, the tolerance for these articles diminishes with advancing years, and it is necessary nearly always with persons who have used them freely to reduce their quantity when middle age is reached. In regulating the diet of substantially healthy persons, it is imperative to beware of hard-and-fast lines. Cases of this group are very diverse; scarcely any two are exactly alike, and their management is complicated often by social considerations which are difficult to justly estimate. We can only hope to avoid serious errors by a patient investigation of each particular case, and by bringing to bear upon it a full knowledge, combined with a large infusion of common sense.

These suggestions apply to cases where the patient is only troubled with some slighter ailment or indisposition which does not incapacitate him from taking his part in the world's work, nor necessitate any great deviation from his usual habits. In regard to the dietetic management of a case of fever, or of diabetes, or of gastric ulcer, or, indeed, of any of the more serious forms of sickness, medical men are of, in general, one opinion; but in persons in the main healthy, the advice tendered by different practitioners is apt to show a lamentable want of consonance, or even total contradiction.—*Therapeutic Gazette*, No. 1, 1891.

QUININE IN TYPHOID FEVER.

Many physicians still prescribe quinine in typhoid fever by giving 15 to 30 grains in four doses, to be taken during the day. In this manner no therapeutical result is obtained, because it is seldom that a reduction of temperature follows.

Although, according to DR. MANASSEIN'S observations, quinine is retained longer in the system of a fever patient than in health, it is a well-known fact that quinine begins to be eliminated by the kidneys after ten minutes, that after twelve hours the whole dose is secreted and eliminated, and that elimination is greatest after six hours from the time the drug is taken. Therefore, small doses cannot have any effect.

In typhoid fever it is advisable to give large doses at short intervals, viz., 20 to 30 grains in one hour. To overcome the pyrexia it is necessary to administer the drug six or eight hours before the rise of temperature, viz., 8 to 15 grains at ten o'clock and 15 grains at eleven o'clock in the morning.

DR. HUCHARD found the combination of quinine and antipyrine very useful in the following proportion: hydrobromate of quinine and antipyrine of each 75 grains; to be divided into ten doses, two doses to be taken during the day.—*Centralblatt f. Gesamte Therapie*, Heft v., 1890.

BORIC ACID IN CONSTIPATION.

HERR FLATAU has suggested to the Medical Society of Berlin the use of boric acid in chronic constipation. In cases where the lower part of the rectum protrudes through the anus, and remains visible after powerful contractions of the levator ani and sphincters, the quantity of forty-five grains of boric acid is either dusted or rubbed on the mucous membrane in sight. In cases in which the mucous membrane is not visible it must be insufflated. It is important that the medical attendant should carry out the procedure himself, at any rate at the commencement. The patient should then keep quiet for a time. In from an hour to three hours peristaltic action will be observed in the colon. He has never seen a failure from this method of treatment, nor has he seen a case where the patient got so accustomed to it that it ceased to be effective. On the contrary, if carried out systematically daily, permanent improvement in time takes place, and normal peristalsis is secured.—*Medical Press and Circular*, 1890.

CHLORAL-ANTIPYRINE.

Hydrate of chloral combines with antipyrine to form two definite compounds, one containing a molecule of chloral hydrate and one of antipyrine—monochloral hydrate; the other containing two molecules of chloral and one of antipyrine—bichloral antipyrine. PROFESSOR LEE has found that in their physiological action they are both like chloral, but differ from it in having a less depressing action upon the circulation.

In doses of thirty to forty-five grains they are comparable to chloral as hypnotics. Compared with sulphonal and chloralamide and chloralimide, the compounds of chloral and antipyrine are less certain in their hypnotic action.—*La Médecine Moderne*, No. 52, 1890.

water—does much good in the way of rousing the uterus into action. But when all things fail, as a last resort we may tampon the uterus and vagina thoroughly with iodoform gauze, or, if this is not at hand, some cloths to which glycerin is added. The bleeding is soon arrested, the uterus begins to contract, tone in its walls is secured, and one can feel at ease that the patient is out of all immediate danger.

In capital operations, such as the removal of large and vascular tumors from the neck, the female breast, etc., the plan is simply to tie bands around the legs and arms close up to the body. This arrests the return of blood to the body, while the flow of blood into the limbs still goes on. By this means a very large amount of blood in the body is rapidly collected into the four extremities and the pressure is taken off the central vessels. This method gives time for the use of other means.—*New York Medical Record*, December 1, 1890.

A CASE OF SEVERE ACUTE ANÆMIA CURED BY SALT-WATER INJECTIONS INTO THE RECTUM.

In a case of enormous hæmorrhage during a severe long-continued labor, in which the placenta was too early detached, Drs. HERR and HAUSSMANN used the treatment advised a short time ago by Gill for preventing death by hæmorrhage.

Mrs. S., aged thirty-seven years, rhachitic in her youth, had at the time a contracted pelvis (true conjugate 8 to 9 cm.). Since 1882 she had five dead children, with very difficult labors.

At the beginning of the labor under discussion, severe hæmorrhage occurred, for which Dr. Heer was quickly summoned. Under the most difficult complications and continuous hæmorrhage, version and extraction were accomplished. This time also a dead child was delivered (impaction of head at promontory).

After the birth the mother's pulse was barely perceptible. In spite of repeated subcutaneous injections of camphor, ether, and internal stimulants, together with powerful massage of the uterus, over which considerable time was consumed, the patient sank into a complete anæmic, bloodless condition. The pulse was imperceptible, the superficial veins of the arm were empty and could not be distinguished. On this account and because there was no time to lose, neither transfusion or subcutaneous injection was practicable, but especially on account of the rapidity and ease of its administration the rectal injection of a solution of one-half per cent. lukewarm salt water was employed. About two quarts of the fluid were introduced, which was quickly absorbed. During the injection the patient's pelvis was raised.

Later a syncope occurred again with vomiting, pulse absolutely imperceptible, temperature subnormal. Therefore another salt-water injection was made into the rectum, which was retained. Soon after the radial pulse could be felt feebly. The following morning the general condition was improved, pulse somewhat stronger, 129 to 140 a minute, temperature 99.5° F. After the control of the anæmia the convalescence progressed rapidly.

So simple a life-saving method is at least worthy of a trial by clinical instructors and practitioners.—*Centralblatt f. Gesamnte Therapie*, Heft v., 1890.

On the other hand the remedy had almost always the disadvantage that after its discontinuance sleep was disturbed for a long time, and patients who had formerly been quiet at night became restless. It happened in three cases that a number of days after suspending the use of the remedy the patients were confused even without having an epileptic attack.

Patients thus affected had suffered before, but it was evident that the confusion caused by suspending the use of amylyhydrate lasted much longer. The confusion was also observed when the dose was gradually diminished.

It seems very remarkable that in several patients, who had had before only one or two attacks a day, had after suspending the remedy a series of attacks.

Among these was an imbecile fifty-five years old, who from his earliest youth had suffered from epilepsy, and who in recent years had an average of nine to ten attacks every month without any especial excitement or confusion. Under treatment with amylyhydrate the number of attacks was diminished to eight a month. When the administration of the remedy was suspended nine attacks occurred daily during the next six days and the patient died during the last.

The autopsy indicated nothing special except a very marked hyperæmia of the brain.

It may be mentioned that in two patients who had been under treatment by amylyhydrate the attacks remained less severe. These were patients who before had had pronounced epileptic convulsions.

The number of Dr. Umphenbach's experiments is small, but the result may suggest caution in the future administration of amylyhydrate.—*Therapeutische Monatshefte*, Heft x., 1890.

HÆMORRHOIDS.

DR. W. R. THOMAS is very confident that the majority of cases of hæmorrhoids we meet with are entirely preventable, and that many of those which are far advanced can be cured by medical treatment alone, but it is necessary when treating them to give due consideration to all the causes and treat each one. Among the factors which have to do with the production of hæmorrhoids, and each one of which should be considered in the treatment, there are many. The valveless condition of the portal veins, gravitation, obstruction owing to hepatic disease, obstruction from hepatic, cardiac, or pulmonary disease, sedentary habits, excessive eating and drinking, excessive obesity, too frequent use of purgatives.

For successful treatment, the patient should have a daily movement of the bowels regularly. Sponging the anus and surrounding parts with soap and cold water, is a very efficient application, thus removing acrid fluids which, during the ensuing day, would irritate the skin. A larger proportion of vegetable diet, and a smaller proportion of meat. Cases of hæmorrhoids with constipation may sometimes be cured by attention to this alone. Sufficient exercise is of much importance. Some patients may obtain relief from a daily injection of as much water as can be retained for four or five minutes with comfort. Lukewarm water may be recommended at first, but as soon as the patients can bear it, cold may be ordered. Those who suffer from hæmorrhoids should, if possible, give up taking stimulants entirely.—*Lancet*, No. 5, 1891.

CHRYSAROBIN IN PSORIASIS.

DR. UNNA recommends

Chrysarobin	5 parts.
Salicylic acid	2 "
Ichthyol	5 "
Vaseline	88 "

Made into an ointment and to be rubbed into the affected parts.—*Nouveaux Remèdes*, No. 23, 1890.

CAMPHORIC ACID IN CYSTITIS AND FOR THE NIGHT-SWEATS OF PHTHISIS.

Of a twenty per cent. solution of camphoric acid in	
alcohol	10 parts.
Water	400 "

To be used to wash out the bladder, twice a day.

It will stop the decomposition of the urine, but has no influence on the secretion of pus.

For the night-sweats of phthisis three doses of fifteen grains each may be taken during the day, or forty-five grains on retiring.—*Nouveaux Remèdes*, No. 23, 1890.

TREATMENT OF SCABIES WITH CREOLIN.

DR. DE LALLIS reports the use of creolin in scabies in the form of a five-per-cent. ointment, rubbing it once daily into the affected parts. Only four such applications are said to be necessary to produce perfect cure. Creolin, in his opinion, is preferable to any other remedy for this purpose, especially possessing the advantage over sulphur of not producing any eczema of the skin, and not staining either the skin or the linen.—*Therapeutic Gazette*, No. 1, 1891.

HYDRATE OF AMYL IN EPILEPSY.

As suggested by Wildermuth, DR. UMPHENBACH tried amylhydrate with seven patients who had suffered from epilepsy for many years. The ages of the patients were from twenty to fifty-five years, and the dose given was one drachm and a quarter to two drachms pro die.

Dr. Umphenbach has not observed particularly favorable results from its use.

Two patients who on an average had had nine and eleven attacks a month, had no attack while taking amylhydrate.

The third patient was helped by the remedy at the beginning. He passed the first month without any attack, while formerly he had had thirteen, but on further trial the remedy failed. The patient had as many or more attacks than before.

With the other four amylhydrate did not markedly affect the number of attacks. The remedy was well taken by the patients, but produced in nearly all of them a great tendency to sleep. Their appetite was unimpaired.

clinical point of view to the disease described by Duchenne under the name of acute and subacute anterior spinal paralysis of the adult, and which are, in fact, dependent upon lesions of the anterior horns of the cord.

2. On the other hand there is a group of symptoms, more or less analogous to the preceding from a clinical point of view, and which may even cause confusion in diagnosis, to explain which no appreciable lesion of the spinal cord can be found.

3. It can be absolutely affirmed in certain of these latter cases that the symptoms are connected with the peripheral neuritis found to be present.

4. There is room to suppose that the cerebral centres, whose participation in the process is proven by the clinical symptoms, play a pathogenic rôle in these cases. (Amyotrophic polyneuritis accompanied by psycho-motor affections.)

5. It does not seem possible to determine with positiveness the relation which exists between these amyotrophic paralyses due respectively to poliomyelitis and polyneuritis. At the same time the hypothesis which seems most plausible is that of a lesion of the neuro-muscular arc (cerebral motor cells; ganglionic cells of the cord; motor nerves; muscles) by a pathogenic agent which attacks with greater or less intensity the different parts of this apparatus.

DIPHTHERIA.

H. WOLF (*Fortsch. d. Med.*, 1890, 8, 954) has for two years used a combination of menthol with sugar in the proportion of 1 or 2 to 20 in the treatment of diphtheria. This powder he rubs upon the parts affected by the disease. The deposit often sticks to the brush and is removed by it. The brush is then again carried into the throat and the menthol-sugar thoroughly rubbed into the part. This procedure is carried out two or three times daily. Even by the second or third day the dirty-gray appearance disappears, and a clean excavated ulcer remains which quickly heals under the continuance of the treatment. To control the fever he employs antipyretics.

ON A CASE OF INFECTIOUS ADENIE DUE TO THE STAPHYLOCOCCUS PYOGENES AUREUS.

ROUX and LANNOIS (*Rev. de Méd.*, 1890, 1011) report a case of adenie in a child which has confirmed them in the belief that certain cases of the disease are of an infectious nature. The child, a girl, eight years of age, had commenced two months before to exhibit large glandular swellings in the neck. When first coming under the observation of the writers, the glands in several parts of the body were found swollen, including those of the neck, axillæ, and groins. There was embarrassment of respiration and evidence of enlargement of the glands of the anterior mediastinum. The tonsils were enormously swollen. The liver was very large, and the spleen quite so. There was no leukæmic condition of the blood. The case ran a course fatal within two weeks, exhibiting during the illness considerable fever, attacks of abdominal pain, increase in the size of the glands, with purpura and multiple hæmorrhages. The blood contained rather numerous very large leucocytes.

MEDICINE.

UNDER THE CHARGE OF

J. P. CROZER GRIFFITH, M.D.,

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HOSPITAL OF THE UNIVERSITY OF PENNSYLVANIA.

THE PATHOLOGY AND DIAGNOSIS OF PEDICULATED AND GLOBULAR
CARDIAC THROMBI.

ZIEMSEN (*Fortsch. d. Med.*, 1890, 8, 959) adds another instance to the (as he says) five cases of globular thrombi described in medical literature. He describes two instances of large pediculated cardiac polypi of the left auricle, which, he says, produced the same symptoms as the globular thrombi. Basing his opinions upon these three cases, together with cases already described by Hertz, he believes that a probable diagnosis can be made under the following conditions, namely: 1. The presence of a mitral stenosis. 2. The evidence of very great obstruction to the flow of blood in the left chambers of the heart, greater than is wont to occur in the case of simple mitral stenosis. Cyanosis and dyspnoea are, too, unusually intense, and the filling of the arteries extremely meagre, so that the nourishment of the parts of the body furthest removed from the heart is so slight that gangrene may develop. The last symptom was witnessed in all three of the author's cases, and in one of Hertz's.

[Ziemssen has evidently overlooked the case described by Osler (*Johns Hopkins Hosp. Rep.*, ii. 1, 1890) in which a freely movable, round elastic thrombus, the size of a walnut, lay in the left auricle above the much-narrowed mitral orifice. The thrombus had given rise during life to no special clinical symptoms.—ED.]

POLIOMYELITIS AND POLYNEURITIS.

BLOCQ and MARINESCO (*Nouvelle Iconographie de la Salpêtrière*) publish a valuable and well-illustrated contribution upon this subject. The existence of infantile acute poliomyelitis is undoubted; that of acute, sub-acute, and chronic poliomyelitis in the adult has, however, been questioned. The authors quote four cases with autopsies from the literature—of which they have made a careful review—as well as one not previously reported, which prove that all three adult forms do exist. They also report a case in detail which presented symptoms analogous to those of acute poliomyelitis, though there were certain psychic symptoms attending them, but which the autopsy showed to be an instance of polyneuritis. The case was very interesting, particularly on this latter account, and approached in its symptomatology a group of cases described by Korsakoff as "psychic, toxæmic cerebropathy," or "polyneuritic psychosis."

As a result of their studies the authors draw the following conclusions:

1. There exist certain morbid conditions which exactly correspond from a

organs in these persons failed to reveal the presence of any old or recent tubercular process. In eighteen of the cases the inoculated rabbits died too early to allow of conclusions being drawn. Of the remaining thirty cases it was found that the bronchial glands of eight contained tubercle bacilli as shown by the development of tuberculosis in the rabbits inoculated with the substance of the bronchial glands. In five of these eight cases death occurred suddenly from accident while the patient was in the midst of apparently perfect health. The author makes the point that this tuberculosis of the bronchial glands in the apparently healthy cannot but be a constant menace to the individual, and may explain the development of tuberculosis in those without hereditary taint, in which the disease seems to be excited by an acute simple bronchial catarrh, or some other non-tubercular pulmonary disease.

The article contains the case histories of the thirty cases, and the details of the inoculation experiments carried out in each instance.

REPORT ON THE KOCH TREATMENT OF TUBERCULOSIS.

OSLER (*Johns Hopk. Hosp. Bull.*, 7, 1891) describes in detail the results of the series of inoculations with the Koch fluid upon eleven cases of pulmonary tuberculosis. As far as possible cases were chosen which had been under observation for some time, and which presented well-defined but limited lesions, without extensive formation of cavity, or signs of rapid progress of the disease. The cases are reported in detail, and the paper is unaccompanied by any general conclusions. A review of the cases seems to indicate that the first case exhibited considerable reaction at times, finally with the development of albuminuria with casts, and with high fever, as a result of which the injections were discontinued. The amount of sputum was practically unaffected. The bacilli were increased in number and somewhat altered in shape. There was no alteration of the physical signs. In the second case the reaction was slight or absent. Possibly the râles were larger and louder after a month's treatment; in other respects the physical signs were unchanged. In the third case the most noteworthy feature was the great increase in the number of bacilli in the sputum. The patient lost some in weight; there was not much reaction after the inoculations, nor much fever at any time; elastic tissue appeared in the sputum near the date at which the observations are reported. The râles were not so large and loud; otherwise there was no change in the physical signs. In the fourth case, under treatment for two weeks, no special change had yet occurred in the general or local condition. The amount of the sputum was diminished. The fifth case exhibited a decided diminution in the amount expectorated; but no change in the physical signs after three weeks of treatment. Reaction was absent or very slight. The sixth case exhibited nothing to note. The reaction was sometimes well marked. The condition of the physical signs after two weeks' treatment is not stated. The seventh case had no bacilli at the outset, and seemed to be one of bronchiectasis. No reaction, except a slight rise of temperature, was developed by the inoculations. Bacilli were soon, however, constantly found in the sputum in small numbers. In the eighth case there was nothing to note. The ninth case had been

At the autopsy there was found hypertrophy of the glands and of the spleen, multiple visceral hæmorrhages, large white kidneys, enlargement of the liver, and multiple nodules in the lung, shown by the microscope to be miliary abscesses. Numerous bacteriological experiments are detailed, made with the blood taken during life, with fragments of lymphatic glands, and with the small pulmonary nodules. These proved the presence of the staphylococcus pyogenes aureus in the cultures, and showed that inoculations with these cultures produced, among other lesions, enlargement of the lymphatic glands.

The authors terminate their contribution with the following conclusions :

1. The different glandular affections comprised under the name of pseudo-leukæmia or adenie ought to be separated into two groups, the first of which comprises the lympho-sarcomata, and the second the infectious adenies.

2. The infectious adenies themselves ought very probably to be divided into several varieties; and it is probable that these varieties are produced by different pathogenic agents.

3. The case of the child reported is an instance of infectious adenie.

4. Cultures and experiments show that the causal agent in this case was the staphylococcus pyogenes aureus.

5. It is owing to morphological and biological peculiarities presented by the staphylococcus in this case that the new characteristics, very probably, are to be attributed; resulting in microbic production of simple glandular hypertrophy instead of the formation of pns.

HYDATID CYST OF THE LIVER.

SHATTUCK (*Bost. Med. and Surg. Journ.*, 1891, cxxiv. 3) reports an instance of suppurating hydatid cyst of the liver with multiple hepatic abscesses, interesting on account of the difficulty attending the diagnosis and on account of the rarity of the disease in this country. The patient, a woman, twenty-three years of age, exhibited the symptoms of an hepatic abscess which was supposed to be due to gall-stone. There appeared to be moderate enlargement of the liver and spleen, with irregular fever, no jaundice. The sudden death of the patient prevented the thorough study of the case. The autopsy showed the cause to be the presence of an hydatid cyst, as stated. The author knows of only thirteen cases of hydatid cyst reported in this country from 1880 to 1890.

THE ETIOLOGY OF TUBERCULOSIS.

H. P. LOOMIS (*N. Y. Med. Rec.*, xxxviii. 689) publishes a carefully prepared article based upon the evidence of thirty autopsies and upon experiments upon animals, and proving that tuberculosis may exist in the bronchial glands in adults as well as in children who are not suspected of having any tubercular affection, and in whom the lungs *post-mortem* are found unaffected. During a period of eighteen months over which the experiments extended, the substance from the bronchial glands of forty-eight persons was injected into rabbits. The majority of these forty-eight persons died suddenly, and none of them after any prolonged illness. A careful examination of all the

by it. As additional signs of the increased tension in pure mitral stenosis there is not infrequently an accentuation of the aortic second sound, and a moderate increase in the thickness of the wall of the left ventricle.

In mitral insufficiency the pulse has a tendency to become large and soft, and usually accelerated. Since in this affection two paths are open for the blood during systole, the peripheral vessels must necessarily dilate and thereby diminish the resistance as far as possible, in order that the greater part of the blood may enter the aorta, consequently there is observed the suddenly rising pulse-wave and the marked dicrotism, as in cases of fever, together with a more rapid succession of heart-beats, in order to prevent a too long continuance of the low tension.

TWO UNUSUAL CASES OF PNEUMONIA.

KELYNACK (*Med. Chron.*, Nov. 1890) reports two cases of pneumonia occurring in a man and his wife, both of which present several points of interest.

As one of the patients—the woman—was taken sick but a short time after the other, the possibly contagious character of the disease is to be considered or the origin of both cases from some common miasmatic cause. The possibility of complicated enteric fever was considered, but such a conclusion was apparently unwarrantable. The unusual nervous symptoms are worthy of note. In the woman a peculiar tetanoid condition developed, which lasted several days. In the man there were choreiform movements with severe myalgia, distinct arthritis of the ankle, and intense muscular hyperæsthesia of the lower extremities. From a therapeutic point of view the cases indicate the value of continuous ice-cold applications as the only reliable antithermic agents.

THE PULSE AND THE ARTERIAL TENSION IN AORTIC STENOSIS.

HAGEN (*Med.-chirurg. Rundsch.*, 1890, 605) refers to the views of Oppolzer, Rosenstein and Eichhorst, all of whom agree that during the systole an amount of blood less than normal passes through the narrowed aortic orifice, and that as a result of this the pulse becomes, *rarus*, *parvus*, *tardus*, and *durus*. They differ, however, in the method of explaining these phenomena. Basing his observations upon two well-marked cases the author endeavors to determine the method of the production of the pulse-characteristics. In both of the cases the radials and temporals were very prominent without thickening of the vessel-walls, without visible pulsation, compressible only with difficulty, not collapsing after the pulse-wave had passed, and having only slight elevation during the wave. He believes that the overfilling of the arteries in aortic stenosis is due to a loss of elasticity in the vessel-walls, which, as a result, can only slowly propel the blood onward, and consequently dilate more and more. The hardness of the pulse he attributes to the strong cardiac contraction, the diminished elasticity, and the overfilling of the vessels. He thinks that these pulse-characteristics occur only in pure aortic stenosis, and are pathognomonic of this affection.

under observation too short a time to allow of any conclusions. The reaction was slight or absent, except on one occasion, when it was well marked. In the tenth case, under treatment for nearly two weeks, there had been no essential change and no reaction. The eleventh case had had but a few inoculations; there had been no general reaction.

Two cases of pleurisy, suspected of being tubercular, also received the treatment. The first exhibited well-marked reaction from two inoculations, but six other injections were not followed by fever. In the second case the sputum increased, and then again diminished in quantity. The physical signs were unchanged. The reaction was sometimes fairly well exhibited.

BACTERIOLOGICAL-CHEMICAL INVESTIGATIONS ON TUBERCLE BACILLI.

A. HAMMERSCHLAG (*Centralbl. f. klin. Med.*, 1891, 9) contributes a study on certain points regarding the chemical and metabolic characteristics of the bacilli of tuberculosis. The conclusions which he draws are as follows:

1. Tubercle bacilli contain fat, lecithin, albumin, cellulose, and a poisonous substance which produces convulsions when injected into rabbits and guinea-pigs.

2. The characteristic tinctorial nature of the tubercle bacilli depends upon a peculiar arrangement of the albuminous substance and the cellulose in the body of the microbe.

3. Carbo-hydrates and glycerin are substances indubitably necessary to the nourishment of the bacilli.

4. In cultures the bacilli produce an albuminous substance which produces rise in temperature in rabbits inoculated with it.

5. The bacilli could be with certainty robbed of their virulence by cultivating them during eight months in glycerin-bouillon at a temperature of 38-39° C. These weakened cultures did not, however, seem to have any power of giving immunity to the disease.

THE RELATION BETWEEN PULSE-CURVES AND VALVULAR LESIONS.

As a result of sphygmographic studies in cases of well-compensated mitral disease, v. NOORDEN (*Centralbl. f. d. med. Wissensch.*, 1891, 26) discovered that in mitral stenosis the pulse had a higher tension than in healthy men; while in mitral regurgitation the tension is less than normal. Under the same conditions, *i. e.*, in the presence of good compensation, a pulse-curve with marked elastic vibrations and slight dicrotism indicates a predominance of stenosis of the mitral orifice; while slight vibratory variations and marked dicrotism is diagnostic of a predominance of mitral insufficiency. In explanation of these facts the author assumes that not only the heart muscle, but the arterial system as well, has to do with the establishment of compensation. In mitral stenosis, namely, the work of compensation is thrown on the right heart. If, now, the systemic arteries contract, with a consequent increase of tension, a less degree of fulness of the left ventricle will suffice, and the burden of the right ventricle is thereby lessened, since it no longer needs to pump the normal amount of blood into the left side of the heart. The increase of the work for the left ventricle, due to the increased tension, is easily overcome

the side; no diarrhœa, except after laxatives. In June he came under treatment elsewhere, and soon after began to cough up blood-stained mucus. At times there was a little blood in the stools, but no diarrhœa.

The cough and expectoration continued, he had two or three stools a day containing mucus and blood. He had no chills, but at times fever and sweats. On the day of admission to the hospital, October 5, 1890, the expectoration was noticed to be of a peculiar rusty, reddish-brown color, purulent, and with an odor resembling that of anchovy sauce. Actively-moving amœbæ were found in it, at once calling attention to the bowels and liver. After admission there was no diarrhœa, but one or two well-formed stools a day containing traces of blood and a little mucus, and amœbæ in great numbers. The liver was not enlarged anteriorly, but considerably enlarged behind. There was dulness and feeble somewhat tubular breathing at the base of the right lung, but no definite signs of a cavity. There were elastic tissue and alveolar epithelium in the sputum, but no tubercle bacilli. The temperature was only slightly elevated. The diagnosis in this case rested solely on the examination of the sputum, as attention would never have been called to the actual condition by the character of the stools.

SURGERY.

UNDER THE CHARGE OF

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THE PRESENT POSITION OF ANTISEPTIC SURGERY.

In an address (*Annals of Surgery*, January, 1891; *British Medical Journal*, Jan. 10, 1891) delivered in the post-graduate course of the University of Toronto, DR. J. WILLIAM WHITE replies to Mr. Tait's recent criticism of Sir Joseph Lister's Berlin address. After reviewing Tait's position, he says:

The antiseptic treatment of wounds might, under Mr. Tait's ruling, be described as a treatment directed against the causes of putrefaction in wounds; but a more accurate definition expands it, as Mr. Cheyne has suggested, so as to include treatment directed against the cause, not merely of the putrefactive fermentation, but of all fermentations.

The sterility of the blood and tissues is denied by Mr. Tait, who says: "The germs exist already in the blood and elsewhere, and are ever present, according to the best authorities." The elaborate and carefully-conducted experiments of Hauser, Watson Cheyne, and others completely contradict this

EHRLICH'S TEST IN TYPHOID FEVER.

C. E. SIMON (*Johns Hopk. Hosp. Bull.*, 1890, 93) refers to the nature of the diazo compounds, and their tendency to enter into combination with aromatic bodies, and cites the first experiments of Ehrlich while endeavoring to discover some of these aromatic bodies in the urine. Owing to the controversy which arose regarding the diazo reaction, especially as to its diagnostic import in typhoid fever, the test has come to be regarded by many as a medical curiosity of no clinical value whatever. The author, however, is convinced by his experience that the original work done by Ehrlich is not appreciated, since his own results fully coincide with those which Ehrlich obtained. After explaining the chemical nature of the reaction as far as it is understood, and the methods which Ehrlich advocated, he details the modification which he has found most convenient as well as most delicate. Two solutions are made, one of 50 cc. of hydrochloric acid in 9950 cc. of water, and this saturated with sulphanilic acid; the other of a one-half per cent. solution of sodium nitrite. To make the test, 40 cc. of the first solution is thoroughly agitated with 1 cc. of the second. A few cc. of this is next thoroughly shaken in a test-tube with an equal quantity of urine. One cc. of ammonia is now allowed to run down the side of the test-tube, forming a colorless zone above the mixture, and at the juncture of the two a more or less deeply colored ring will be seen, the slightest carmine tint—the characteristic of the diazo reaction—being made out by contrast with the colorless layer above and the yellow urine below. Various plays of color may appear in different urines, but in that of typhoid fever there is produced a red coloration, which may vary from an eosin to a deep garnet. Simon has examined the urine of almost every disease which has occurred in the wards of Johns Hopkins Hospital, but has observed the reaction only in cases of typhoid fever and phthisis pulmonalis. He has had no opportunity of searching for it in cases of contagious fevers, in which Ehrlich has occasionally found it present.

The report now made is based upon observations in thirty-six cases of typhoid fever, and the details of the examinations of these are given. The results which he obtained lead him to conclude that, with the methods of examination given by Ehrlich, the reaction may be obtained without difficulty in typhoid fever from the fifth to the thirteenth day of the disease, and that with his own modification it may still be seen as late as the twenty-second day. Its absence from the fifth to the ninth day indicates a very mild case, excepting in children, although this rule is probably not an absolute one. As it occurs previously to the appearance of the rash, it is a very useful aid in the diagnosis in typhoid fever.

AMOEBA COLI IN THE SPUTUM IN A CASE OF HEPATIC ABSCESS.

SIMON (*Johns Hopk. Hosp. Bull.*, 1890, 97) reports a case of abscess of the liver in which perforation had taken place into the lung, and the giant amœbæ were detected in the expectoration. The patient, aged twenty-nine, complained of cough only. He had been a sailor formerly, and had been in the West Indies in 1883. In May he had had constipation and pains in

Similar observations have been made by Passet, Pawlowsky, and others, and are as well known as any in connection with antiseptic surgery.

It is evident that what is original in Mr. Tait's "hypothesis" is not true, and that what is true in it is not original.

Dr. White then replies to Tait's attack on the double-cyanide dressing (which he characterizes as "deadly and dangerous"), giving a tabulated statement of 195 cases healed with this dressing, with the course of the case and its results.

Of the five deaths in this list, two were due to preëxistent and chronic disease; the other three were abdominal cases, operated on with the patients almost *in extremis*, with swollen bellies, intestinal paresis, and in one case with suppurative peritonitis. In the whole list there were not six freely suppurative cases, and there were no cases of septic trouble and no deaths from any form of blood-poisoning.

He then discusses the relative merits of asepsis and antiseptis, and concludes as follows:

"It cannot be disputed that in the light of modern science the operator has a twofold duty, namely, to prevent the entrance of living pathogenic microbes into the wound, and at the same time to preserve the vitality of the tissues themselves. We have abundant reason to believe in a general antagonism between the body-cells and the microorganisms of disease, and it follows that the theoretical propriety of non-interference with these tissues cannot be doubted, and Lister plainly admitted and accepted this new view when he said that the floating particles of the air having been shown to be less harmful than was supposed, we may possibly dispense with antiseptic washings and irrigation, 'provided, always, that we can trust ourselves and our assistants to avoid the introduction into the wound of septic defilement from other than atmospheric sources.'

"When this method is adopted it is evident that all strong antiseptic solutions which might compromise the vitality of the tissues must be discarded; instruments, silk, ligatures, sponges, etc., must be sterilized by heat, hands must be washed clean in sterilized water (after previous chemical disinfection), and the same is true of the skin over the field of operation. If antiseptic solutions are used at all they must be very feeble—1 to 60 carbolic for instruments (after previous sterilization by heat), 1 to 10,000 sublimate for sponges, etc.

"In the meantime, however, while waiting for further improvement in this direction, I have felt and still feel that it is safer in a large general clinic to depend upon full antiseptis rather than upon asepsis."

RESECTION OF THE SACRUM IN INTRA-PELVIC OPERATIONS.

A. BROCA (*Gazette Heb. de Méd. et de Chir.*, No. 40, t. xxvii. p. 467) presents an interesting article upon preliminary resection of the sacrum in operations upon the pelvic organs. These operations are of two kinds: in one the resection is final, the bone being removed; in the other, the resection is temporary, and the bone is restored after the operation. In the first operation, that of Kraske, a longitudinal incision is made in the median line from the middle of the sacrum to the anus. The tissues are divided to the bone.

statement, which is really the foundation of Mr. Tait's argument. The germ theory of fermentation is undisputed. Fermentation in wounds can, therefore, be prevented by the exclusion of germs; it has been shown microscopically that these can be kept out (asepsis) or can be destroyed (antisepsis); practically, therefore, it only remains to show the effect upon patients with operative or other wounds of excluding or destroying germs to show the value or lack of value of antisepsis and the antiseptic theory. By looking back a few years to the very beginning of the employment of antiseptics, we can obtain the most striking and convincing evidence of the effect of treatment directed almost exclusively, though then very imperfectly, against the introduction of bacteria.

The record of the work of Professor Lister may well begin our series of examples. In Glasgow, in 1864, 1865, and 1866, Mr. Lister's mortality in a series of operations of all sorts was 45.7 per cent., largely from septic diseases. About this time he began to employ gradually some antiseptic methods in his treatment of wounds and during operations. In 1867, 1868, and 1869, his mortality fell to 15 per cent. At Edinburgh, having greatly improved the details of his system, we find that from 1871 to 1887 he treated 553 grave surgical cases, with a mortality from septic disease of only 0.36 per cent., a diminution in the death-rate which, when we remember that these different results were obtained by the same man operating upon the same class of patients and for the same injuries or diseases, is so striking as to be in itself conclusive. The statistics of Volkmann and others are then given, showing with equal force the astonishing change wrought in surgical results by the introduction of antisepsis. Mr. Tait endeavors to break the chain of reasoning by saying: 1, that the germs are everywhere and cannot be got rid of—a misstatement—and 2, that the presence or absence of sepsis depends on the presence of "pabulum"—that is, dead organic matter, blood-clot, serum, etc. It has been one of the axioms of antiseptic surgery from the beginning that scrupulous attention should be paid to hæmostasis and to drainage. No one has taught this more earnestly than Lister and his followers, and Tait's adoption of it as his "view" is evidence of his ignorance of the work of others.

It is easy to say, as Mr. Tait does, that if you have nothing to decompose there will be no decomposition, for that is what it amounts to. "Get out all decomposable matter," he says, "and you can let the germs in freely," but in practical surgery this is by no means always possible. Mr. Tait deals habitually with a membrane, the peritoneum, which has a remarkable power of self-protection. Microbes gaining access to the abdominal cavity are exposed to destruction either by the serum which it copiously exudes, or by a possible phagocytic action of its enormous numbers of endothelial cells, or by both.

Mr. Tait's remarks against dosage are further evidence of his want of acquaintance with Listerian work and teachings. He says: "With the Listerians one germ is as good as a thousand." It is safe to class Mr. Watson Cheyne, who has just been quoted, as a "Listerian." In Mr. Cheyne's lectures on "Suppuration and Septic Diseases," he not only asserted, but proved experimentally, that the number of bacteria introduced modified greatly the intensity of the symptoms and even the character of the disease.

The first roller is permitted to harden somewhat before the succeeding ones are applied; the limb is then swathed, as usual, in a plaster bandage.

In fractures about the elbow the joint is fixed at an angle of 110° , because in case of ankylosis this gives the most useful limb.

The anæsthesia may be prolonged sufficiently for the plaster to harden. In two or three days the latter is carefully divided into two equal halves longitudinally, and the upper half lifted off without disturbing the limb. If the bones are in good position this upper half is again reapplied. Three days later the patient is again anæsthetized and the dressing entirely removed. If the fracture is about joints passive motion should be practised. The limb is then lightly swathed in batting, and the whole is held in position by two leather splints previously cut in shape by measurement. On the following day the upper half of the splint is lifted off and slight passive motion is practised. On the eighth or tenth day the casing is removed, its halves are bent back at the posterior border and the anterior edges are provided with shoe-lace hooks. After five days the bandage is removed and passive motion practised, after which the splint is entirely discarded during the daytime and worn only at night, the patient being instructed to practise gentle motions with the injured limb. At the end of the fourth week the cure is completed.

The results in 165 fractures treated by this method were entirely satisfactory. The author strongly urges that fixation apparatus should be discarded except at night by the fourteenth or fifteenth day.

CYSTS OF THE PANCREAS.

A report of two cases of cyst of the pancreas, which were operated upon by KAREWSKI, is given in the *Medical Press and Circular*, New Series, vol. iv., No. 2689, p. 492.

In both cases the disease followed a fall upon the side. In the first case the tumor was noticed for the first time four weeks after the accident. The man suffered with colic-like pains, dyspepsia, vomiting, and marked emaciation. Exploratory puncture revealed a large quantity of cholesterin crystals, which have been pointed out by Küster as characteristic of pancreatic cysts. Abdominal section was performed, and the cyst was tapped and sutured to the abdominal walls. Recovery was easy. The sinus was closed six weeks after operation.

The second case presented similar symptoms to the first, and recovered easily after operation.

In both these cases cyst of the pancreas was diagnosed before operation.

CONTUSIONS OF THE ABDOMEN.

M. MOTY (*Revue de Chirurgie*, No. 11, 1890, p. 878) presents a valuable paper on contusions of the abdomen, with special reference to injuries from horse-kicks—accidents of frequent occurrence in the army.

He divides the cases into three classes: the light, medium, and grave. The first class includes contusions in which the intestines and other important organs have escaped injury; simple contusion of the mucous membrane of the intestine without lesion of the other coats; cases in which a small per-

The gluteal muscle and the sacro-sciatic ligaments are divided; and then with the chisel and mallet the lower left half of the sacrum is removed as far up as the third sacral foramen. The canal is not opened if the division of the bone is made somewhat to the left of the median line. This, however, is not a matter of much importance.

The temporary resection, with an osteo-cutaneous flap, was proposed by Heinecke for cancer of the rectum, and has been performed by Hégar for a gynecological operation.

A Y-shaped incision is made over the sacrum commencing an inch and a quarter below and within the posterior inferior spine of the ilium and ending at the tip of the coccyx. The upper flap is left adherent to the posterior surface of the sacrum. The muscles and ligaments are separated from the bone, and the rectum is removed from the anterior surface. Then the sacrum is divided with a chain-saw along an oblique line the right extremity of which is between the third and fourth sacral foramina, the left extremity at the sacral cornu. When the bone has been divided the flap with the skin is raised and replaced at the end of the operation.

M.M. Lévy and Delbet have modified the form of the operation by making the bone-flap from the lower part of the sacrum cut transversely across. This has the advantage of preserving the insertions and the strength of the pelvic floor.

By resection of the sacrum free access is obtained to the pelvic contents. The operation is indicated in cancer of the rectum, for hysterectomy, and for some cases of pelvic abscess; especially those which are separated from the general peritoneal cavity, and are not accessible for extirpation.

HYDATID CYST OF THE SPLEEN.

BRAINE (*Annales de la Policlinique de Paris*, No. 2, p. 49, 1890) reports an interesting case of hydatid cyst of the spleen. The patient was a man, thirty-four years old, who lived in Normandy, and who had always been surrounded with dogs. In 1884 a tumor appeared in his left side which troubled him only on account of its size. In July, 1887, this tumor was tapped, and over three quarts of fluid were withdrawn. In the following October the cyst had refilled, and had reached its original dimensions. Laparotomy was performed one month later. Over two quarts of sero-purulent fluid were withdrawn by a trocar. The cyst was found to be attached to the spleen, and as it was impossible to remove it the puncture in the cyst was enlarged and the walls stitched to the abdominal wound. The patient recovered perfectly, and six months after the operation the abdominal wound was firmly closed throughout.

THE MANAGEMENT OF FRACTURED LIMBS.

As the result of personal experience, VON DONHOFF (*New York Medical Record*, vol. lii., No. 20) states that the best results are obtained by first securing absolute reduction, aided, in case of fracture of the shoulder, elbow, wrist, hip, knee, or ankle-joint, by the exhibition of an anæsthetic. Next the limb should be scrupulously cleansed and the replaced fragments should be fixed in position by means of a plaster-of-Paris roller adjusted over cotton batting.

and one-half inches in length. There was almost complete evisceration. There was an extensive wound of the mesentery, but no wounds of the intestines. He was operated upon one and one-half hours after the injury.

Four large branches of the mesenteric artery were tied. The abdomen was freely washed out with hot water and drained with the glass tube. The costal cartilages were sutured with silk, and the interchondral spaces were drained with iodoform gauze.

The recovery was remarkably easy, the temperature never rising above $100\frac{2}{3}^{\circ}$ F.

The lung was at no time more than partly collapsed—a fact explainable by the presence of old pleuritic adhesions.

OTOLOGY.

UNDER THE CHARGE OF

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OTORRHAGIA IN CIRRHOSIS OF THE LIVER.

DR. ROBERT LEUDET, of Rouen, France, contributes an article with the above title, illustrated by a case (*Annales des Maladies de l'Oreille*, etc., October, 1890). Hæmorrhages are not uncommon in diseases of the liver. In the entire list, however, Leudet has not been able to find any mention of hæmorrhage from the ears, as occurring in the course of hypertrophic cirrhosis. The author has observed in one case only, viz., cirrhosis of the liver, a series of hæmorrhages from the ear. The subject was forty years old, a laborer in a storehouse of wines and liquors, and had been for several years a hard drinker, especially of rum. Hæmorrhages occurred frequently from the left ear, for two weeks, during his stay in the hospital. The patient then left the hospital, and was no longer observed.

BACTERIOLOGY OF THE CONTENTS OF THE EUSTACHIAN TUBE IN CHRONIC CATARRHAL INFLAMMATIONS OF THE MIDDLE EAR.

DRS. MAGGIORA and GRADENIGO, of Turin, have made a long series of observations on the above-named subject. Their conclusions are that "at least in the sclerotic or dry period of otitis, the diseased process does not depend upon an infection demonstrable by any of our methods of research, but we cannot deny that we are inclined to the assumption, on the ground of clinical experiences, that in the hypertrophic and secretory stage of the naso-pharyngeal inflammation that the process depends upon some specific microorganism." (*Centralblatt für Bakteriologie u. Parasitenkunde*, October 30, 1890.)

foration exists without escape of intestinal contents, and followed by speedy closure from adhesion.

This first class is diagnosed by the progressive disappearance of the symptoms of shock, and the absence of signs of perforation and extravasation.

The second class includes those cases which present some complication—as acute general peritonitis, rupture of a large vessel, or of important viscera: that is to say, all those cases which require a treatment of two or three weeks.

The third class includes those in which rupture or extensive laceration of the intestine has taken place.

Even in the mild cases the prognosis should always be reserved for one or two weeks on account of the possibility of peritonitis appearing later, either from the yielding of the bruised intestinal wall, or from infection through the muscular and serous coats, after destruction of the mucous coat.

An extensive contusion of the intestine is often more dangerous than a small perforation. The fact is well illustrated by a case of Jobert's. A man received a contusion of the abdomen by being run over by a carriage, and recovered perfectly in ten days. He died a month later of pneumonia, and the autopsy revealed a small perforation of the jejunum closed by adhesion to the omentum. Cicatricial contraction and consequent stricture of the intestine sometimes follow severe contusions of the abdomen.

The author considers that one of the most characteristic signs of perforation of the upper part of the gastro-intestinal tract is acute pain following a few seconds after the injection of fluids.

He arrives at the following conclusions:

1. Horse-kicks of the abdomen in many cases produce grave lesions of the intestines.
2. These lesions are perforations produced in three ways: by rupture, by crushing, and by laceration.
3. The diagnosis of perforation can often be established by the acute pains resulting after the injection of fluid.
4. Large perforations and ruptures demand laparotomy and intestinal suture.
5. This operation may be successfully performed notwithstanding the presence of peritonitis.
6. Exploratory laparotomy—for diagnosis—is not permissible. The expectant plan of treatment is always indicated in case of doubt.
7. The prognosis of contusion of the abdomen should be reserved for a month, in view of the complications which may result.

STAB-WOUND OF THE THORAX AND ABDOMEN.

BROKAW (*St. Louis Courier of Medicine*, vol. iii., No. 6, p. 257) reports a remarkable case of very extensive stab-wound of the thorax and abdomen. The thoracic wound extended from the third rib to within one inch of the navel. The lung was wounded, and the cartilages of the fourth, fifth, sixth, seventh, eighth, and ninth ribs were divided.

The abdominal wound extended from the right of the navel to within two inches of Poupart's ligament on the left side. The abdominal wound was six

followed. It was instantly plugged with iodoform gauze before more than one ounce and a half of blood had been lost. The wound in the neck was now closed in the ordinary manner, and drainage maintained by horse-hair.

For the first twenty-four hours the patient did well. His temperature did not rise above 102° , and his general condition was good. He then had an attack of hæmoptysis. Some hours later he was seized suddenly with dyspnoea, "evidently due to extension of the clot in the jugular vein into the lungs, or else to an embolus which was detached and passed into the pulmonary vessels." He then died in one hour. No post-mortem could be obtained.

The operation of ligation of the internal jugular in such cases was alluded to in the chapter on Otology in this journal, December, 1890.

FATAL EAR-DISEASES.

DR. F. KRETSCHMANN, of Magdeburg, has delivered a lecture with the above title before the Society of Physicians of the Magdeburg district (date not given). The opening words are those of the late Professor von Troeltsch: "Ear-diseases are among the most serious and most frequent maladies to which the human organism is exposed." This is due to the fact that catarrhs of the upper respiratory tract invade the mucous membrane of the middle ear. A large number, therefore, of chronic aural affections are caused solely by catarrhs, or other pathological conditions of those parts. Furthermore, a large contingent of aural diseases are induced by measles, scarlatina, typhoid fever, smallpox, whooping-cough, influenza (as of late), syphilis, and tuberculosis. Von Troeltsch estimated that in every three individuals in middle life, at least one has imperfect hearing in one or both ears.

Among the results of aural diseases is first placed loss of hearing, which interferes with the labors and pleasures of life; occurring in childhood it renders the young child mute, and in any case interferes with its education. Among other discomforts are subjective noises in the ear, which are often harder to endure than the deafness. Psychoses, in those predisposed, are often induced by tinnitus aurium, and disturbances of equilibrium are often caused by chronic ear-disease.

A very accurate and concise description is then given of the anatomy of the external, middle, and internal ear, and the relation it sustains to neighboring and vital parts in the cranium.

Meningitis from otitis is generally found at the base, rarely on the convexity of the brain. Its course is usually very short, lasting only two days, when death closes the scene. Cerebral abscesses are frequently caused by chronic purulent otitis. They are most frequently found in the temporal lobe, and, in the cerebellum, are usually separated from the surface of the temporal bone, and the pus-nidus in the same, by a thin layer of healthy brain-substance. Half of all abscesses in the brain are due to chronic purulent processes in the middle ear. Their diagnosis is often obscured by the presence of meningitis. Extensive destruction of brain-substance can occur without fever or disturbances in mobility, sensibility, or intelligence. In most cases, however, complaint is made at intervals of headache, combined with nausea and vomiting, which is, at first, sometimes mistaken for migraine.

USE OF PYOKTANIN IN EAR DISEASE.

DR. ROBERT BARCLAY, of St. Louis, Mo., reports the result of the use of pyoktanin (methyl-violet) in chronic purulent otitis media in eight cases (*St. Louis Courier of Medicine*, November, 1890). The strength of the watery solution was 1 to 1000. The results have been exceptionally good and prompt. The application has been made by instillation usually. [The yellow and the blue pyoktanin appear entirely innocuous, even in much stronger solutions, as they have been employed by us in strengths of ten and twenty grains to the fluidounce for mopping, not for instillation.—R.]

 PYÆMIA AND THROMBOSIS OF INTERNAL JUGULAR VEIN FROM OTITIS MEDIA; TREPHINING MASTOID AND OPENING LATERAL SINUS.

DR. W. W. KEEN has recorded an interesting case with an operation, unique in this country (*Philadelphia Times and Register*, December 20, 1890). The patient, a man, thirty-one years old, had had a chronic otorrhœa for eight years. Five months previous to consulting Dr. Berlet, who finally called Dr. Keen in consultation, the patient had consulted an alleged specialist, who had put something into his ear, which caused intense and prolonged suffering. From that time the patient gradually developed pyæmia. On November 16, 1890, the patient had a fœtid discharge from the right ear, which showed a perforation in the membrana tympani. The mastoid was but slightly swollen; it was moderately painful upon pressure, with a little pain just above and behind it, but no pain over the course of the lateral sinus, between this point and theinion. Over the mastoid process the neck was extremely tender, though but little swollen. The jugular vein could not be felt. The patient had difficulty in swallowing, and was somewhat hoarse. He was a little jaundiced, and the liver was rather tender. There was some dulness on the whole of the right side from slight pleuritic effusion. No headache. Beginning choked discs.

The mastoid was then trephined, and a considerable amount of cheesy fœtid pus was evacuated. The bone was then chiselled away backward and upward so as to expose the lateral sinus. The mastoid vein was cut early in the chiselling, but the profuse hæmorrhage was checked by plugging with iodoform gauze. In this way three-fourths of an inch of the sinus was exposed, which looked dirty yellow, with a tinge of brown and green. It felt soft to the probe, but was detached from the bone, so that a probe could be easily passed downward and forward for over an inch, thus evacuating a little offensive pus. Dr. Keen then exposed the jugular vein in the neck. The tissues were found quite firmly bound to one another by inflammatory adhesions, but the vein was exposed after some difficulty, and found thickened, but *almost entirely collapsed*. A ligature was then thrown around it, an inch and a half above the clavicle. On cutting the vein above the ligature very little blood oozed out, but fragments of an excessively fœtid clot were evacuated from its interior. The facial vein, where it enters the jugular, was thrombosed. The part of the vein from the ligature up to the facial was then removed, and the gaping mouth of the vein above sewed to the skin by two stitches. Next the lateral sinus was opened. A violent gush of blood

until the fourth day, the patient being confined to bed or to his room. The length of the strip parallel to the palpebral fissure is about that of the lid, and its width equal to the additional height to which it is desired to have the upper lid raised. The operation can be done under cocaine, as it is not prolonged, and even without complete anæsthesia will not cause great discomfort.

THE DIVISION OF ANTERIOR SYNECHIÆ.

W. LANG practises and recommends (*Royal London Ophthalmic Hospital Reports*, December, 1890) the general division of these cicatricial connections between the iris and cornea, whether left after cataract extraction, accidental wounds, or perforating ulcers, either large or small; and whether the connection be merely between the anterior surface of the iris and posterior surface of the cornea, or the iris or lens capsule be entangled in the wound. The division is accomplished with a blunt-pointed knife. In dealing with incarcerated capsule or thread-like synechiæ, the elasticity of the structure to be divided makes necessary quite free movements, and sometimes one or more repetitions of the operation. In such cases it is well to put the synechia on the stretch by the use of eserine or atropine, according as it is peripheral or central.

Large adherent leucoma should thus be treated soon after the anterior chamber is well established, and before corneal staphyloma occurs, or secondary glaucoma sets in. Were this generally attempted, many eyes would be saved from loss through these pathological conditions. Even where the leucoma seems to extend up to the very edge of the cornea, it must be remembered that the angle of the anterior chamber extends back of the sclera to a region very rarely or never involved in perforating ulcers. So that it is possible even in these cases to pass the blunt-pointed knife back of the synechia and sever it.

GLIOMA OF THE RETINA.

J. B. LAWFORD and E. T. COLLINS (*Ibid.*) present a study of the records of sixty cases, five from private practice, the others from the service of the Moorfields Hospital in the last twenty years. As to sex, males slightly predominate. The age at which the presence of the growth was first noticed, as near as this could be determined, was, at birth in five cases; during the first year in seventeen others; during the second year in thirteen; and the oldest patient was seven years. In all of the cases included, the microscopic examination of the enucleated eye conclusively established the diagnosis of glioma. In eight cases there is known to have been permanent recovery—that is, the patient was alive and well more than three years afterward, longer than the latest recurrence of the disease after removal. Six others are known to be still alive, but three years have not elapsed, and in one of them the other eye is involved. Twenty-eight of these cases are known to have terminated fatally; the longest duration of life after the operation in any of these fatal cases was fourteen months. The average interval between the discovery of the disease and the removal of the globe, was: in six cases that are known to have recovered, four months; and in sixteen cases that termi-

In abscesses of the cerebellum there is constant pain in the occiput. There may occur vertigo, unsteady gait, hectic fever, inequality in the pupils, choked discs, defective memory, and slow pulse, and sometimes aphonia. Death results either from cerebral pressure or from meningitis induced by rupture of the abscess within the cranial cavity.

Perhaps the most frequent cause of death from chronic purulent otitis media is pyæmia, brought about by phlebitis of the cerebral sinuses, usually of the lateral sinus. Systemic infection from a thrombus in such cases shows itself by chills, followed by sudden rise in temperature. The fall in temperature is just as sudden, accompanied by excessive perspiration.

In some cases erosion of large veins or arteries near the ear is the cause of death. In other instances cholesteatomatous collections form in the tympanic cavity or in the mastoid antrum; more commonly in the latter. Pressure from these masses upon surrounding bone leads to atrophy and erosion of the same. In this way the cranial cavity, the transverse sinus, the external auditory canal, or the labyrinth may be broken into, and meningitis, cerebral abscess, or pyæmia be set up.

Carcinoma and *sarcoma* may appear in the chronically diseased ear, the first being developed from an old otorrhœa, originating from the epithelium of the auditory canal or the drum-cavity. Its duration is about one year and a half. It usually attacks those between forty and sixty years of age.

Sarcoma develops generally from the dura mater or from the periosteum of the mastoid process. Its course is more rapid than that of carcinoma, being only from three to six months. It occurs most frequently in children.

Thus it is shown that a purulent process in the ear is no trifling matter.

OPHTHALMOLOGY.

UNDER THE CHARGE OF

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THE OPERATIVE TREATMENT OF PTOSIS.

DR. HEISRATH, of Königsberg (*Berliner klinische Wochenschrift*, January 19, 1891), has, by his experience with excision of portions of the conjunctiva for granular disease of that membrane, been led to adopt an allied procedure for the relief of ptosis. His operation removes a strip of the tarsal cartilage with the corresponding portion of the conjunctiva, and brings the edges of the wound together with three or four sutures, which are allowed to remain

widening of the connective-tissue trabeculæ, and spreading apart of the individual nerve fibrils, as if the tissue were œdematous and swollen. In sections taken from the cuneus there was in all instances a remarkable dilatation, of the pericellular lymph spaces with degeneration of the protoplasm of the cell. This was probably most marked in the dog longest blind. It is pointed out that these appearances may be due to imperfections in the hardening process. Except the single case of clot in the central vein, no positive microscopic lesion was made out. But, even in dogs blind a month, there is no atrophy of the nerve fibres in the ordinary sense; neither is there any appearance of neuritis in the earlier stages.

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

UNDER THE CHARGE OF

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ETHYL BROMIDE IN OPERATIONS IN THE NOSE AND RHINOPHARYNX.

In removing adenoid vegetations, CALMETTES and LUBET-BARRON very highly recommend (*Gaz. Hebdomadaire*, August 23, 1890) anæsthesia under ethyl bromide and excision with the trianguloid ring-knife of Moritz Schmidt.

In operating upon posterior turbinate hypertrophy DR. A. E. PRINCE, of Jacksonville, likewise extols anæsthesia by ethyl bromide (*N. Y. Med. Journ.*, August 30, 1890). He uses a pair of slender gouge curved turbinate forceps passed through the inferior meatus. The extremity of the forceps is controlled by a finger passed through the mouth, and the mass is removed by a torsion movement which partly cuts the morbid tissues and partly tears them.

SUPPURATION OF THE MAXILLARY SINUS.

DR. MOREAU R. BROWN, of Chicago, who has had an unusually large experience in these cases—nineteen cases within eighteen months—recommends (*N. Y. Med. Journ.*, July 19, 1890) penetrating the most dependent portion of the antrum immediately above the alveolus or through its upper portion. He either divides the mucous membrane, or excises a small section with a tubular knife just below the gingivo-labial fold between the upper portions of the roots of the second bicuspid and the first molar teeth. A drill, best propelled with an electric motor, is entered at the point of incision and is directed upward, inward, and slightly backward, so as to form an angle of about 45 degrees with the plane of the alveolus. After thorough cleansing, a gold tube is so fitted for drainage that its distal end will just enter within the antrum, and the projecting extremity carries a small strip of

nated fatally, fourteen months. Family history seemed to throw no light on the etiology of the affection. No instance was found in which it had attacked more than one member of the same family. These statistics, which agree in the main with those previously recorded, teach that glioma is not a hopeless condition as regards life, but that the chances of cure are greatly diminished by delay of removal of affected eye or eyes.

INDICATIONS FOR ENUCLEATION OR EVISCERATION OF THE EYEBALL.

DR. BRAUNSCHWEIG, from a general review of the subject (*Deutsche medicinische Wochenschrift*, January 8, 1891), comes to the following conclusions: The orbit is to be emptied of its contents for malignant new-growths that have emerged from the eyeball, or which, without starting from the eyeball, which may be sound, have so involved the other orbital contents that nothing less will secure their complete extirpation.

Enucleation is to be resorted to for intraocular tumors that have not perforated the sclera, and therefore have not involved the extraocular tissues; for intraocular disease that tends to extend centripetally through the optic nerve or its sheath, as glioma of the retina or sympathetic ophthalmitis. Enucleation is also to be used instead of evisceration, when the utmost reduction of pain and shortening of the period of healing are aimed at, without regard to the cosmetic result.

Evisceration is to be undertaken when something must be done for increase and change of form of the globe, independent of new-growths, as staphylococcus degeneration; for panophthalmitis whether or not it involves the orbital cellular tissue; for disease confined to the scleral contents, as foreign bodies in the interior of the globe, irido-cyclitis, glaucoma, or sympathetic ophthalmia; and for wounds that exclude the hope of preserving the eyeball.

QUININE BLINDNESS.

DR. G. E. DE SCHWEINITZ reports (*Ophthalmic Review*, February, 1891) on the ophthalmoscopic appearances and the pathological anatomy of the nerves and centres in quinine blindness as developed experimentally in dogs. When the drug was given hypodermically—from one to four grains to the pound of the animal's weight, blindness, generally accompanied by more general disturbances, was apparent in from three to fourteen hours. It remained practically complete in one animal until twenty-nine days, when it was killed. In another there was slight return of vision after thirty-six hours of blindness.

In all, the pupils were immovably dilated, and the ophthalmoscopic appearances were similar to those of quinine amaurosis in man. In one there was complete obliteration of the vessels, and in another blurring of the optic discs. In one case, two days after the quinine was given, blindness being complete, a constriction was noted in one of the veins as though a thrombus had formed, and the microscopic examination verified the diagnosis. The specimens examined microscopically included the eyes, nerves, chiasm, tracts, and occipital lobes. They were hardened in Müller's fluid, cut by the paraffine method, stained by borax carmine and indigo-carmin, and degenerations sought by Weigert's method. Cross-sections of the nerves showed, in some, a

of arrest by topical measures than in adolescents and adults. Dr. Wright proposes section of the tonsil with an amygdalotome, the cutting blade of which is an incandescent wire heated by the electric current. Taking Mackenzie's amygdalotome for adaptation, he removes the steel blade and substitutes one made of compressed paper, a non-conductor, with its extremity excavated in the form of a crescent across which the platinum wire is stretched. By means of copper wires inlaid along the sides of the blade, the platinum wire is connected with binding screws at the other end of the instrument, where, by means of the ordinary spring, the circuit from a cautery battery is closed by the pressure of the thumb as the blade is driven against the mass included in the loop of the instrument when adjusted.

CARCINOMA OF THE ŒSOPHAGUS, WITH INVOLVEMENT OF THE TWELFTH DORSAL VERTEBRA.

DRS. JAMES FINLAYSON and JOSEPH COATS report (*Glasgow Med. Journ.*, September, 1890) a case of cancer of the œsophagus involving the left recurrent laryngeal nerve in a male subject fifty-six years of age. He had aphonia and paralysis of the left vocal band, cough and expectoration, aphagia as to solids and great dysphagia as to liquids. There was severe pain in the abdomen which could not be accounted for.

After death a small tumor, partly ulcerated, was found in the anterior wall of the œsophagus about the level of the bifurcation and firmly adherent to the parts in front, where it was continuous into a bulky mass involving the root of the lung and involving the left recurrent laryngeal nerve. The intrinsic muscles of the left half of the larynx were distinctly atrophied. There was a second tumor almost replacing the substance of the body of the twelfth dorsal vertebra and projecting beyond the inter-vertebral cartilages. The spinal canal was reduced to a diameter of three-sixteenth inch.

PERICHONDRITIC ABSCESS OF THE LARYNX WITHOUT THE USUAL SYMPTOMS.

DR. DAVID NEWMAN, of Glasgow, records (*Glasgow Med. Journ.*, September, 1890) an interesting case of laryngeal perichondritis in a previously healthy female, forty-five years of age, which terminated fatally about two months after the initial manifestations, which were rigors, soon followed by slight sore-throat, in its turn gradually increased to hoarseness, inspiratory dyspnoea, and cough. Œdema of the mucous membrane of the arytenoid cartilages and of the ventricular bands left an exceedingly narrow chink for respiration. There was great cardiac debility. Against the advice of her attendaut, the patient left the hospital when somewhat relieved. Subsequently she had several severe attacks of paroxysmal dyspnoea, probably due to laryngeal spasms. The cardiac debility increased, and death ensued quietly without any signs of dyspnoea.

At the autopsy the posterior surface of the cricoid cartilage was found eroded a little to one side; and immediately below the vocal band of the opposite side was an opening leading into a small abscess cavity which reached down the trachea for about half an inch.

gold which is fastened to a collar around the tooth. This affords free drainage without any necessity for plugging the tube to prevent access of foreign substances into the antrum. Dr. Brown has found that ten of his cases thus treated have invariably done better than those in which an opening had been made through the alveolus from below.

ERYSIPELAS OF THE PHARYNX AND LARYNX.

According to DR. MASSEI (*Rev. Gén. de Clinique*, etc., August 20, 1890), erysipelas of the pharynx and larynx can be diagnosed by three symptoms: 1. Swelling of the mucous membrane of the base of the tongue, the epiglottis, and the ary-epiglottic folds, producing dysphagia. 2. The mobility (diffuence?) of this swelling, which, by its rapid production and its no less rapid subsidence, renders the functional symptoms equally evanescent. 3. The temperature and fever, which are those of erysipelas.

Differential diagnosis from neuralgic angina is facilitated by the simultaneous or consecutive localization of the disease in the pharynx and larynx.

Massei also distinguishes two forms of erysipelas, *i. e.*, primitive and consecutive, the latter being a complication of migratory pneumonia, or an accidental development in adynamic subjects.

The treatment consists in ice internally and upon the integument; pulverizations of corrosive sublimate 1:2000; tracheotomy, when indicated by serious complications.

PHARYNGEAL SYPHILIS FATAL BY ULCERATION OF THE INTERNAL CAROTID ARTERY.

DR. V. RAULIN reports (*Annales de la Polyclinique*, July, 1890) from Moure's clinic, a case of syphilis of the pharynx in a male cook, twenty-two years of age, which progressed to denudation of the bodies of the upper vertebra, and terminated suddenly by hæmorrhage. Four years previously, the patient had had a chancre which healed very quickly, and which had been accompanied by bilateral suppurative adenitis. Though not submitted to mercurial treatment, there had been no mucous patches, roseola, or alopecia. Minute inspection failed to reveal any other sign of syphilis than the pharyngeal lesion. The disease was believed to be an example of a tardy manifestation of hereditary syphilis; an opinion supported by the history of the death of all his brothers and sisters, seven in all, at the ages of four, five, six, and seven years.

ELECTRO-CAUSTIC AMYGDALOTOMY.

In an elaborate article, well supported with statistical references, on hæmorrhage after amygdalotomy (*N. Y. Med. Journ.*, August 30, 1890) DR. JONATHAN WRIGHT, of New York, condemns the operation in adolescents and adults, in whom severe hæmorrhage is much more likely to occur, and extols it in the cases of children, in whom the danger is practically nothing. We would simply remark in this connection that very serious hæmorrhage does occur at times in young children, and when it is severe is more difficult

diagnostic importance of Koch's discovery and its influence on tubercular tissue, Dr. Thibierge says plainly that as far as lupus is concerned, there was not one single case amongst all those which he could see in Berlin which had been even *apparently* cured by the injections. In every case which he had examined, some of which had been injected for two months, the little round apple-jelly or barley-sugar nodules in the corium were still present, and would prevent any experienced dermatologist from regarding the case as cured. Thus, in one case of extensive lupus of the face which had undergone eleven injections, the last three being of the strength of two centigrammes, and which was presented as a cure by the assistants in the clinic, because no further local reaction could be produced, nodules could be plainly seen when the superjacent hyperæmia was removed by stretching the skin between the fingers. Another case, a woman, who had been subjected to sixteen successive injections between October 11th and November 26th, presented no local or general reaction after the thirteenth injection, even though the doses in the last injections had been as high as 14, 20, 30, and 40 milligrammes. In spite of the treatment a number of very evident lupus nodules could be still seen lying in the supple cicatricial tissue, which had replaced the previous lesions. Much of this misplaced enthusiasm was due to dermatological inexperience, these cases having been treated in the ordinary surgical clinics. Extraordinary and perfectly unique as is the power of the injected fluid to cause the shrivelling up and destruction of lupus tissue, up to the present time it seems to have failed to completely eradicate this disease in any one single well-authenticated case.

KÖHLER, of Berlin (*Medical Press and Circular*, February 4, 1891), exhibited two cases of lupus before the Free Society of Surgeons that had been under treatment for three months. The first was a case of lupus of the nose, upper lip, both cheeks, and lower jaw. The alæ of the nose showed the ulcerating form. On injection the general and local reaction was great. Tubercle bacilli were found in the crusts. From October 20th the patient had received 730 milligrammes of the fluid, and since November 20th there had been absolutely no reaction. The healing on the alæ of the nose, where ulceration had existed, was an ideal one. Other localities did not respond so well, redness still remaining.

The second case was a disease of fourteen years' duration. First injection October 11th. The total quantity injected was 1240 milligrammes, the largest dose being 110 milligrammes. No reaction since November 3d. Healing took place with redness and scaling. This case does not seem to have resulted so satisfactorily as the first, and, as Dr. Köhler remarked, neither case could be considered as entirely cured.

OBSERVATIONS ON THE QUESTION OF DUHRING'S DISEASE.

HANS VON HEBRA (*Monatshefte für prak. Dermatologie*, Bd. ix., No. 6) calls attention to the fact that Auspitz, in his *System of Skin Diseases*, described Duhring's disease under the title of "erythema neuriticum," among the "inflammatory tropho-neuroses with irregular course," and that Hebra, Jr., himself, also described the disease in his treatise (a year before Duhring) as erythema neuriticum, herpes, and pemphigus neuriticus, chiefly with the view

There had been no pain on glutition, no enlargement of cervical lymphatic glands, no swelling in front or around the larynx, no pain on external palpation of the cartilage, and no expectoration or accumulation of purulent products; consequently no symptoms indicative of the character of the disease, which, however, indicated some serious deep-seated inflammation by reason of the hoarseness, the œdema, and a somewhat stridulous cough.

DERMATOLOGY.

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KOCH'S TREATMENT OF LUPUS AT THE VIENNA GENERAL HOSPITAL.

KAPOSI, of Vienna (*Medical Press and Circular*, February 4, 1891) showed thirty-two cases of lupus that had been treated by the injections, many of which had remarkably improved in appearance at first, as is always the case after inflammation (as after erysipelas). Attention was called to the similarity of the process with that of inflammation and exudation, the so-called necrotic action of the fluid being denied. When in Berlin, Kaposi stated to Koch that he did not believe, from what he had seen, that lupus could be cured in six weeks, and his subsequent observations have confirmed these views, for from the above thirty-two cases not one is cured, after more than six weeks' treatment. Many have ceased to react to even very high doses of the fluid. In some cases the amelioration of the symptoms having passed off, the lupus nodules have again become very distinct, and in one case nodules have appeared weeks after the treatment in places where there were none before. One case of anæsthetic (macular) leprosy reacted to an extraordinary and intense degree, being converted into a kind of tubercular leprosy; in fact, the condition of the patient was undoubtedly aggravated by the injections. Bilroth has only had one really striking case, a patient with actinomycosis, who very much improved under the treatment, and for whom there were entertained hopes of a permanent recovery. Schrötter presented a case of tubercular laryngitis which had been made much worse by the treatment.

KOCH'S FLUID IN LUPUS.

THIBIERGE (*British Journal of Dermatology*, January, 1891) of the St. Louis Hospital, Paris, gives a full report of the results of this treatment as observed by himself in Berlin. While fully acknowledging the enormous

and laid up, so as to bring the line of stitches at about that portion of the nose which would correspond to the sulcus of each ala. In the case of the middle lobe, of course, the line of sutures was directly across the nose. The dissection of the skin flaps was carefully done so as to have as thin an integument as was consistent with the nutrition of the parts. Healing occurred *per primam*, the dressing having been iodoform collodion." The final result, on the whole, was satisfactory. The author calls attention to the importance of allowing for the contraction of the integument as well as of the scar in such cases. The microscopic examination of the growth agreed, in the main, with that given by authors.

OBSTETRICS.

UNDER THE CHARGE OF

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THE USE OF KOCH'S LYMPH IN NURSING-CHILDREN.

EPSTEIN (*Prager medicinische Wochenschrift*, No. 2, 1891) has made injections of Koch's lymph in a number of infants, and summarizes his observations as follows: Five children who were either suffering from tuberculosis or seemed strongly predisposed to it, showed a peculiar painful œdema, as large as a silver dollar, at the site of the injection, which usually disappeared in six to eight days. Suppuration never occurred, but the skin showed a pale reddish infiltration which seemed to be a direct reaction to the injection. As regards the general effects, a rise of temperature began five or six hours after the injection, and persisted a longer time than is usual in the case of adults. In one case, fever persisted for four days. The general condition of the children was somewhat disturbed by the restlessness and prostration which always accompany an elevated temperature; pronounced symptoms, however, of some effect upon the nervous system were wanting. Regarding dosage for children under three years of age, one-tenth of a milligramme was given, and in some instances, one-twentieth. As a means of diagnosis, Epstein considers that the lymph has a positive and decided value among children.

GUN-SHOT WOUND OF THE PREGNANT UTERUS, WITH RECOVERY.

BRADLEY (*Southern Medical Record*, No. 2, 1891) describes the case of a primigravida six months pregnant who shot herself, the ball entering four inches to the right, and on a line with the umbilicus. When first seen, she was suffering but very little from shock. She was anesthetized with chloroform, and the wound was found to be a penetrating one. She was sitting in

of distinguishing it from pemphigus. The author does not wish to detract in any way from the light thrown upon the disease by Duhring and Brocq. Concerning the nomenclature, Hebra sees no objection to the use of the old term "Hydroa," as proposed by Unna.

DERMATITIS HERPETIFORMIS.

W. ALLAN JAMIESON (*Edinburgh Medical Journal*, January, 1891) gives an interesting article on this disease, with a short account of seven cases, two of them being in children aged two and a half and three years respectively. But the notes of these two cases are not sufficiently clear or full to portray the disease satisfactorily, which is to be regretted, as typical cases have not been reported in children. The author agrees with Duhring, Brocq, and Unna, that the disease is a substantive one, and goes even further than the authors cited in regarding the impetigo herpetiformis of Hebra and Kaposi as a pustular variety of dermatitis herpetiformis. The best results in treatment have been obtained from moderate doses of arsenic, but no detailed report of the action of the remedy is given.

OBSERVATIONS ON PRURIGO, CLINICAL AND PATHOLOGICAL.

R. W. TAYLOR and VAN GIESEN (*New York Medical Journal*, January 3, 1891) go into the subject very thoroughly, and conclude that there is a chronic inflammation of the derma in this disease, most extensive just below the pars papillaris, although the latter, with its papillæ, is also affected in places. It is of the chronic cellular variety, produced by a proliferation of the connective-tissue cells just about the bloodvessels. The hair follicles, sebaceous glands, and smooth muscle fasciculi become changed secondarily, and are not the primary or essential lesions of the disease. They epitomize the disease, succinctly, as follows: Prurigo nodules and papules are due to a circumscribed effusion in the deeper derma or papillæ, which soaks into the rete and produces cysts, which may subsequently atrophy, and is accompanied by a chronic cellular inflammation in the derma with secondary alterations in the hairs, sebaceous glands, and smooth muscle bundles, and hypertrophic regions in the epidermis.

A CASE OF RHINOPHYMA—OPERATION.

OHMANN-DUMESNIL, of St. Louis (*St. Louis Clinique*, October, 1890), reports, with photograph, a case of highly-developed rhinophyma, or hypertrophy of the nose, occurring in a man seventy years of age. The disease began as acne rosacea, caused by indulgence in spirits, and during the last five years rapidly passed into the condition known as rhinophyma. The end of the nose became lobulated and so much enlarged and hypertrophied as by its weight and pressure upon the nostrils to cause difficulty in breathing. Operative interference was demanded, and ablation of the entire mass by the knife was performed, as follows: The lobes of the tumor mass were removed, leaving a small flap of the integument of each in order to cover the denuded surface. This flap in each case was derived from the lower part

THE RESULTS OF ENLARGEMENT OF THE LYMPHATICS IN PUERPERAL SEPTIC INFECTION.

SOULIGOUX (*Bulletin de la Société Anatomique de Paris*, p. 523, 1890), draws attention to the result of enlargement of the lymphatic ganglia in puerperal sepsis. He finds that many of the pelvic pains complained of after this infection are caused by pressure of the enlarged ganglia upon nerve-trunks. The usual function of these bodies is well illustrated in sepsis by their absorption of the septic virus, and the fact that in severe cases a tendency to the formation of abscesses in the ganglia is observed.

EPILEPSY PRODUCED BY INJURY WITH THE FORCEPS.

It is rare that epilepsy can be traced distinctly to an injury produced by forceps, but in a case reported by LANE (*Lancet*, p. 139, 1891), a boy sixteen years old was found to be suffering from pronounced epilepsy apparently caused by an injury to the skull produced by forceps. On examination, there was a groove about three and one-quarter inches long, extending from an inch behind the right coronal suture to about the same distance in front of the lambdoid. Its anterior extremity was above the auditory meatus, its lower limit at the temporal ridge. The floor of the groove seemed a quarter of an inch below the scalp; the left arm was weaker than the right, and its movements defective. The left leg was also of deficient power. A clonus could be produced by raising the left foot, and the reflexes were much exaggerated. The optic discs were normal, the pupils reacted normally, and no evidence of syphilis existed. Lane raised the depressed area of bone, which was exceedingly vascular. The bottom of the depression encroached upon the area of the skull. The *dura mater* was normal, and also the brain beneath. Rapid amelioration of the symptoms followed the operation, giving rise to the hope that ultimate recovery would ensue.

CONCEALED ACCIDENTAL HÆMORRHAGE DURING LABOR.

A fatal case of concealed hæmorrhage is reported by COE (*American Journal of Obstetrics*, February, 1891). The patient was a primipara of nervous temperament, the fœtus being in normal position and presentation. The first stage of labor was delayed by inefficient pains and by the patient's nervousness. She complained of constant pain in the lower part of the abdomen. She had a slight hæmorrhage when dilatation was half completed. On examination, the os was found half dilated, the head engaged, the membranes intact. The pains had become true labor-pains. On palpation, the uterine tumor was larger and softer than previously; fœtal parts indistinct. The patient's pulse was accelerated; she felt weak. The fœtal heart could not be heard, and speedy delivery seemed indicated in the interest of the child. While the patient was using a commode, she had a profuse hæmorrhage. Strong pains began, the membranes were ruptured, the head descended rapidly. As the pulse grew weak, the forceps was applied, and a large, dead child delivered. The placenta was expressed, followed by large clots and a pint of fluid blood. Uterine inertia followed, with very weak

a low rocking-chair when she attempted suicide, the pistol being held close to the body. A probe could be passed between the muscles to Poupart's ligament. Upon laparotomy, the abdomen was found filled with blood and clots, and a ball-wound was found to the right side of the fundus of the uterus near the attachment of the Fallopian tube. This wound was closed by sutures, no wound of exit for the ball being found. About twenty-four hours after the injury was received, the patient aborted with a six-months' fœtus. The fœtus had a ball-wound just behind the acromion process of the scapula, another above the umbilicus, and the right leg was shattered below the knee. The patient recovered in four weeks from the time of the injury.

CONGENITAL NARROWING OF THE VAGINA AND ITS INFLUENCE UPON LABOR.

KLEINWÄCHTER (*Prager medicinische Wochenschrift*, No. 48, 1890), reviewing the literature of this subject and describing cases observed by him, concludes, regarding the treatment of labor in such a condition, that interference should be deferred as long as possible, finding, in thirty-eight cases, that labor proceeded normally in thirteen; in ten cases it was necessary to make multiple incisions, when labor resulted spontaneously. In four the forceps was used; in nine cases multiple incisions did not avail to secure the delivery of the patient, and the forceps was used in addition. In seven cases dilatation was practised during pregnancy, labor resulting spontaneously in only three of these. The conclusion reached was that a serious operation is very rarely demanded in these cases.

PATHOLOGICAL DENTITION.

AN able plea for incision into the gums in cases of pathological dentition appears in the *Annals of Gynecology and Pædiatry*, January, 1891, from the pen of Dr. J. W. White. He shows conclusively the unquestioned indication for incising the gum over the tooth in many cases, and cites convincing proof of the immediate relief which follows such a procedure. The incision should vary somewhat with the shape of the tooth which it is destined to liberate; thus, over an incisor the cut should be a simple linear one, while over the molars a crossed incision is better.

LYSOL, A NEW ANTISEPTIC, AND ITS USE IN OBSTETRICS.

As an improvement upon creolin, MICHELSEN (*Centralblatt für Gynäkologie*, No. 1, 1891), describes his experience in the use of lysol, a preparation of oil of tar. This is a brownish-yellow-colored, oily fluid, smelling faintly of creasote and remaining perfectly clear when diluted with water. A peculiarity of this substance is the fact that it does not make an emulsion with water as does creolin, but a clear solution results when it is mixed with water. Bacteriological tests show it to be as efficient as carbolic acid and creolin. Michelsen has tried this substance in gynecological operations and also in obstetric practice. He finds that in solutions varying from one to five per cent., this substance gave satisfactory results. Its ready solubility, clear color, and freedom from disagreeable odor make it a very convenient antiseptic. So far, no instances of poisoning have attended its use.

educating the muscular as well as the tactile sense. The examiner learns to palpate the patient in different postures, while he himself changes his position from side to side as may be required, not confining himself to the foot of the table. The danger in these manipulations lies in cases of inflammatory trouble, but as the patient is not etherized her pain will serve as a ready guide as to when the examiner has gone too far. By studying this method we learn the finer points in diagnosis, the most important of which is the variable consistence of pelvic enlargements. Thus, by becoming perfectly familiar with the manner in which the empty uterus contracts under bimanual pressure we learn to distinguish the difference in its behavior when it is the seat of a myoma or of metritis; in the former case it contracts irregularly, in the latter it does not contract at all. Again, the spontaneous changes which take place in diseased adnexa are recognized by such careful examination—such as the filling and emptying of distended tubes. He believes that gynecologists have too much faith in the information which can be gained by a single examination of a patient under an anæsthetic.

In discussing the paper Skutsch denied that gynecologists had learned palpation from Brandt, since the latter made no essential departure from the ordinary methods of examination. No one but an expert ought to practise pelvic massage.

Kugelmann stigmatized massage as "a sort of onanism."

Landau, in reply, explained that he meant that repeated careful examination of a patient, according to Brandt's method, not anæsthetized, was attended with less danger than a single examination under chloroform. The proof that the usual methods of examination were not always so satisfactory was shown by the frequency with which the text-books recommend the use of an anæsthetic.

THE TREATMENT OF UTERINE FIBROMATA AND OF SALPINGO-OÖPHORITIS BY THE CONSTANT CURRENT.

GAUTIER (*Ibid.*) has treated ninety-five cases of fibroid with galvanism with the best results. He is firmly convinced that the positive pole has a caustic action upon the endometrium, which opinion he has confirmed by microscopical examinations. Eight patients with pyosalpinx were treated by galvano-puncture, a mild current of twenty to thirty milliampères being used, and in each instance the pus was absorbed, pain was relieved, and laparotomy (which had been strongly advised) was rendered unnecessary. He prefers galvano-puncture in cases of fibroma, and denounces extra-uterine galvanization as based upon an erroneous theory and without positive results.

In discussing this paper Bröse laid down the following rules for procedure :
 1. The physician who essays to practise the galvanic treatment must be familiar with the principles of physics and electro-therapy, as well as with gynecology. 2. Intra-uterine galvanization is alone to be employed in cases of fibroma, endometritis, and pelvic exudation; the use of the vaginal electrode should be discarded, at least when strong currents are employed, since extensive ulceration may be produced. 3. Patience on the part of both physician and patient are required in the treatment of fibromata, since it

pulse and death from heart-failure. While Coe expresses no positive opinion regarding the exact mode in which the hæmorrhage occurred, it seems probable to him that when the patient assumed the upright position upon the commode, the placenta was largely or wholly detached. It was noticed that the placenta was the seat of general fatty and calcareous degeneration. Unfortunately, it was not minutely examined.

GYNECOLOGY.

UNDER THE CHARGE OF
HENRY C. COE, M.D., M.R.C.S.,
OF NEW YORK.

HÆMATOCELE AND HÆMATOMA.

VEIT, in a paper (*Med. Anzeiger zum Centralblatt für die ges. Medicin*, 1890), on this subject read before the last International Medical Congress contends for a more exact diagnosis between intra- and extra-peritoneal hæmorrhage. An effusion of blood within the healthy peritoneal cavity never becomes encysted; if the bleeding ceases the blood is absorbed, if it continues death results. In order that a true hæmatocele may be formed either the effused blood must be encapsulated or slow bleeding must occur into a cavity already formed by adhesions, as is usually the case in extra-uterine gestation.

The diagnosis of free hæmorrhage into the peritoneal cavity rests upon the presence of the usual signs of profound anæmia and not on physical signs, since nothing pathological can be palpated; the differential diagnosis between hæmatocele and hæmatoma, on the other hand, is not usually difficult, as a tumor is always felt. When the former condition is suspected the abdomen must be opened at once.

Landau, in discussing this paper, denied that the recognition of a considerable quantity of free blood within the peritoneal cavity was difficult; dulness of the abdomen on percussion would give a clue to this condition. While it was true that blood effused within the normal peritoneal cavity did not coagulate and consequently tended to become absorbed so long as it was in contact with living epithelium, coagulation would take place as soon as the epithelial layer was destroyed at any point; this might occur from the irritation caused by the stagnating blood itself. As soon as coagulation took place, the formation of pseudo-membranes and encapsulation would follow.

OBSERVATIONS ON THURE BRANDT'S METHOD.

LANDAU (*Ibid.*) says that we are most indebted to Brandt for his improved method of pelvic examination, which leads to more accurate diagnosis by

tage over the partial operation. In both classes of cases it appears that nearly 50 per cent. of the patients in whom the diagnosis was made in the incipient stage of the disease were well two years after operation.

The writer next discusses the question whether it is a fact that the upper segment of the cervix is affected in cases of commencing epithelioma of the portio vaginalis. If this were true, total extirpation would invariably be indicated, but, in his opinion, this has not been satisfactorily proved anatomically.

PÆDIATRICS.

UNDER THE CHARGE OF

JOHN M. KEATING, M.D.,
OF PHILADELPHIA,

A. F. CURRIER, M.D.,
OF NEW YORK,

AND

W. A. EDWARDS, M.D.,
OF SAN DIEGO, CAL.

EXTERNAL PARALYSES FOLLOWING DIPHtherIA.

HAUSEMAN'S (*Rev. Mens. des Mal. de l'Enf.*, 1890) paper is unique in being a careful record of phenomena attending and following diphtheria in his own person. A severe attack of diphtheritic angina began June 19, 1887, false membrane covering both tonsils, the velum palati, the posterior wall of the pharynx to the entrance of the larynx, the œsophagus, and the nasal cavities. The temperature reached 104° F., and there was much albumin in the urine. The disease lasted four weeks. The first symptoms of paralysis were felt upon the right pillar of the velum on the eighteenth day. For the next few days there was much disturbance of sensibility. Then came a feeling of formication in the tongue which gradually increased, then inability to move the tongue freely, and finally total anæsthesia and paresis of the organ. Nervous troubles in other parts developed in a similar manner. Paræsthesia was absent only upon the velum and the top of the larynx. Following the paralysis of the tongue there was paralysis of the buccal mucous membrane, the lips, the cheeks, and then the whole figure. There was paresis of the mimicking muscles and the masticating muscles of the face. The senses of smell and taste lost their acuteness, but sight and hearing were unaffected. In the fifth week the second and third branches of the trigeminal were attacked, the facial, the glosso-pharyngeal and the hypo-glossal, then the vagus and the spinal accessory in the branches supplied to the larynx and œsophagus. The vagus of the heart and intestine was not involved, though there was at times acceleration of the pulse, with partial syncope. In the eighth week the upper extremities, the trunk, and the lower extremities were invaded, with the same succession of symptoms. There was no severe pain, but every day there were general malaise, intellectual depression, insomnia, and a sensation of heat but no rise of temperature. Paralysis of the external

may extend over several months. 4. The deeper the uterine cavity, the more difficult it is to check the hæmorrhages, and the operator should at the outset ask himself whether the patient's strength will hold out during the three or four months which may be required, or whether it would not be wiser to perform myomotomy at once. 5. The galvanic treatment will never entirely replace myomotomy, but it will render the operation unnecessary in many cases. It is possible that the cure might be hastened by a combination of curetting with intra-uterine galvanization. 6. The most gratifying results are obtained in the treatment of perimetric indurations, which are often quickly absorbed; intra-uterine galvanization is preferable, the anode being used if endometritis is also present, otherwise the cathode. 7. Endometritis complicated with perimetritis is best treated in this way. 8. Dysmenorrhœa is relieved by intra-uterine galvanization, but it is not yet certain that stenosis of the cervical canal can be permanently overcome in this way.

TRENDELENBERG'S POSTURE FOR GYNECOLOGICAL EXAMINATIONS.

STROYNOWSKI (*Centralblatt für Gynäkologie*, January 19, 1891) thinks highly of the advantages of this posture in examinations of the pelvis, as well as in laparotomy, especially in certain cases in which the diagnosis is obscure. In a case in which the presence of free fluid in the peritoneal cavity made it impossible to mop out the pelvic organs with the patient on her back, she was placed in Trendelenberg's posture, the fluid gravitated to the upper part of the abdomen, and it was then possible to feel the uterus and adnexa without difficulty. A similar course was followed in cases of intra-ligamentous cyst and subperitoneal fibroid in the utero-vesical pouch. So that now the writer invariably adopts this method of examination in difficult cases. He has met with objections to the posture in private practice.

THE TREATMENT AND CURABILITY OF CARCINOMA UTERI.

In a paper with this title (*Münchener med. Wochenschrift*, 1890, Nos. 42 and 43) HOFMEIER questions if the introduction of total extirpation of the uterus for cancer of the cervix has proved to be a decided advance in the treatment of the disease. In support of his position he cites the statistics of different German operators, showing that Kaltenbach reports 30 per cent. of his patients free from recurrence one year after operation, Martin 41 per cent., Olshausen 47.5 per cent. at the end of two years, and Schauta 47.3 per cent. He criticises the statistics of the Munich clinic—64.4 per cent. without recurrence two years after operation—since they are the same as those claimed by Leopold in 1887. Attention is called to the slight favor with which total extirpation is regarded in England and America, as compared with its popularity in France and Russia. The results obtained by Byrne by the use of the galvano-cautery (77 per cent. cured at the end of two years), and the combined results of Schröder's operation at the hands of Pawlik and the writer, are also alluded to.

The statistics of high amputation by Schröder and Hofmeier (45.2 per cent. free from recurrences after two years) corresponds closely with those of total extirpation, and therefore show that the radical offers no decided advan-

very small number of cases. Desquamation was not seen in a single case. Complications of the respiratory organs were few and benign, bronchitis appearing in 18 cases, and broncho-pneumonia in only 1. In 14 cases there was ocular disturbance, including 5 cases of simple conjunctivitis, 1 of hæmorrhagic conjunctivitis, 4 of vesicular conjunctivitis, 11 of vesicular keratitis, 3 of double keratitis. In 13 cases there was otitis media. There was also 1 case of tibio-tarsal arthritis, and 1 of catarrhal icterus. In general, there was an absence of grave complications in almost the entire series of cases. The period of incubation of the disease could not be determined. Its invasion was usually brusque, the febrile period averaging three days. Convalescence was usually of long duration. The following degrees of the disease were observed, which can hardly be considered as distinct forms:

1. The attenuated form, which was seen in 26 cases. The patient might be able to go about, but there was usually a temperature as high as 101.3° F.

2. The average form, which was characterized by decided febrile action, and intense pain. The patients usually remained in bed from one to ten days.

3. The grave form, which was seen in only four cases, and was characterized by high fever, great prostration, delirium, restlessness, and typhoid or meningitic phenomena.

In only one case was there a fatal issue. The diagnosis was usually easy, though in certain cases it was necessary to exclude variola, rubeola, scarlatina, typhoid fever, and meningitis.

For medicaments, quinine and antipyrine were chiefly used, also purgatives and emetics. When particular indications for other drugs arose, they were met as each case demanded. In addition, rest, light diet, and during convalescence tonic and reparative agents were used.

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DR. EDWARD P. DAVIS,
250 South 21st Street, Philadelphia.

oculo-motorius caused diplopia and crossed images, involvement of the common oculo-motorius caused pupillary paresis and disappearance of a pre-existing myopia due to fault of accommodation. As to the hands, there was athetosis, but not if the will were brought into action to prevent it. The paralytic phenomena were at their maximum in the middle of the third month, at which time, however, there had been an improvement in the condition of the pharynx and face. Convalescence was established in the fourth month. The only treatment consisted in a tonic regimen. Massage was painful and hydro-therapy inefficacious. From this minute auto-observation the author concluded that two paths are to be distinguished along which the diphtheritic virus is propagated; one includes, by metastasis, the lymphatic and blood streams by which the disease reaches the heart, kidneys, and joints, the other is the track of the nerves, the virus progressing, by contiguity, from one nerve to another. The diphtheritic paralysis is probably a toxic neuritis without characteristic anatomical modification.

THE EPIDEMIC OF GRIPPE IN CHILDREN.

COMBY (*Rev. Mens. des Mal. de l'Enf.*, 1890) reports that of 218 children affected with this disease seen by him in the recent pandemic, 124 were girls and 94 boys. The youngest of these was seventeen days old, the oldest fifteen years; 48 were under two years of age, 76 from two to five years of age, and 94 from five to fifteen.

Forty per cent. of the children in Paris were affected with the disease. Apart from the general epidemic influence no particular cause could be attributed. The disease is evidently infectious, the germs being diffused by atmospheric currents. Its contagiousness is not clearly established, though it is probable. Relapses were not infrequent; recurrences during the same epidemic were not usual. The pathogenic germ of the disease has not been isolated, though in the concomitant diseases the pneumococcus was found with pneumonia, the streptococcus with otorrhœa, and the staphylococcus in the vesicles of labial herpes. The principal symptoms were referable to the nervous, the digestive, and the respiratory apparatus. At the beginning there was sharp headache for a day or two in the frontal region radiating to the orbit, and accompanied with photophobia. There were also restlessness, insomnia, and, in a few cases, nocturnal delirium. Convulsions occurred in only three cases. Then there were pains in the back, chest, and knees, less frequently abdominal pain, gastralgia, or enteralgia. After the disappearance of the nervous prostration, muscular weakness and anæmia continued a long time. In 98 cases there was vomiting, and in 38 nausea alone. In only 18 cases was there diarrhœa, constipation being the rule. Fever was constantly present, but showed no well-defined cycle. It usually began with a feeling of chilliness. The pulse was regular, frequently reaching 150 to 160 per minute. The urine was red, acid, contained water, but no sugar or albumin. Cough was present in a third of the cases, being usually due to pharyngitis or laryngo-tracheitis, rarely to bronchial catarrh. Coryza was present in 63 cases, epistaxis in 18, epiphora in 23. There were but few cutaneous manifestations, including labial herpes, urticaria, sudoral erythema, roseola, scarlatiniform erythema, and morbilliform erythema, and these in only a

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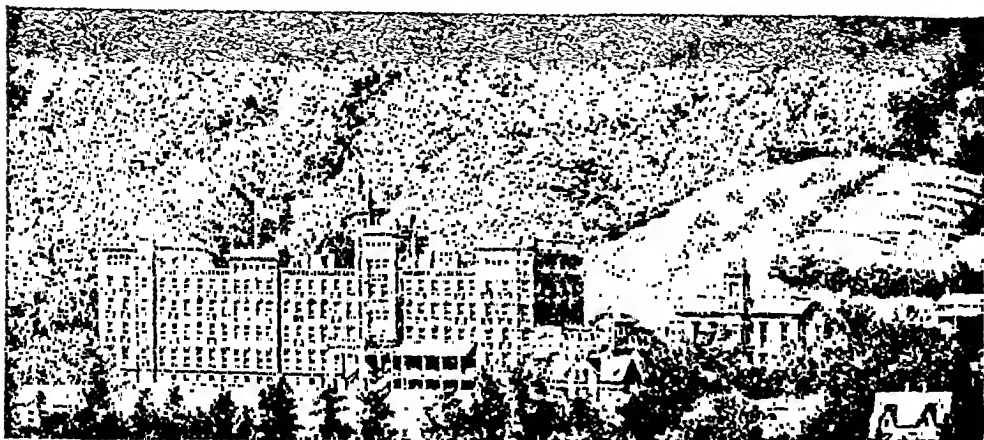
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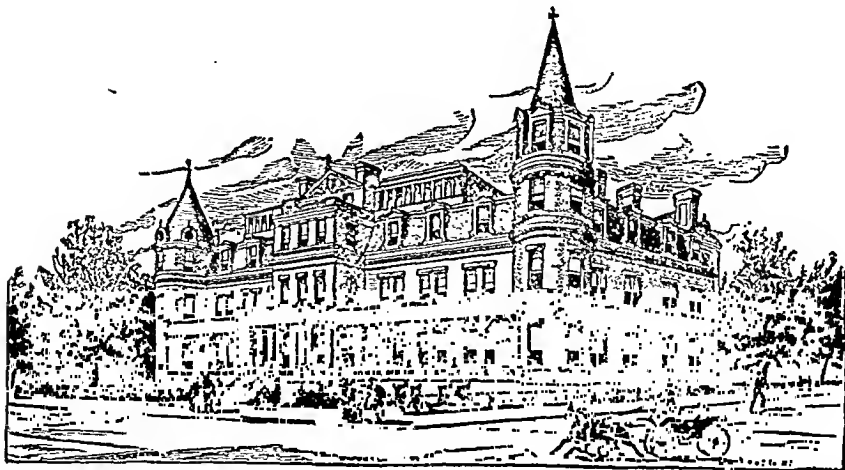
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CONTENTS.

CONTENTS.		PAGE.	
Gunshot Wound of the Abdomen	518	Tuberculous Kidney	520
Operation for Tumors of Intestine	519	A Sectional Splint	520
A Neuroplastic Operation	519	A Method of Applying Plaster Jackets	520

OTOLOGY.		PAGE.
521	On the Etiology of Tinnitus Aurium	521
	On the Etiology of Middle Ear	521
	On the Treatment of Otitis	521
	On the Treatment of Otitis Media	521

OTOLOGY.

Deformity Due to Prominent Ears	521	On the Etiology of Tinnitus Aurium	523
Chronic Dry Catarrh of Middle Ear	521	Abscess of Middle Ear	524
The Jugular Fossa and Deficiencies in	522	Remarks on Early Treatment of Otitis	524
Boxy Floor of Tympanic Cavity	522	Case of Chronic Purulent Otitis Media	525

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

Perforation of Oesophagus in Empyema	525	Tuberculosis of Larynx	527
Chronic Tuberculosis	525	Pachydermia Laryngis	527
Diffuse Pemphigus	526	Laryngeal Myxomata	528
Hoarseness	527	Laryngeotomy	528

DERMATOLOGY.

Absorption of Drugs from Ointments	529	Mollin as a Base for Ointments	530
Lupus Erythematosus	529	Treatment of Cutaneous Tuberculosis	530

OBSTETRICS.

Ventro-fixation of the Uterus	531	Extra-uterine Pregnancy	534
A Study of Placental Infarcts	531	Death from Air in the Uterine Veins	535
Bacteriological Study in Auto-infection	532	A Successful Porro Operation	535
Rupture of Uterus in Twin Labor	532	Congenital Malformation of the Heart	535
Contribution to Theory of Eclampsia	533	Cancer of the Cervix	536
One Hundred Cases of Induced Labor	533	The Blood of the Pregnant and Par- turient Woman	536
Veetis Combined with Traction	533		

GYNECOLOGY.

Chyle-cyst of the Mesentery	536	The Treatment of Prolapsus and Retroflexion by Laparotomy	539
Pregnancy in a Uterus Duplex	537	Formation of Peritoneal Adhesions after Laparotomy	539
Diagnosis of Hæmato-salpinx	537	Forcepressure in Vaginal Hysterectomy	540
Certain Uterine Displacements	537	Abdominal Extirpation of Fibroid Uteri	541
Ovarian Abscess	538	Tachycardia at the Menopause	541
Epi-cystotomy for Malposition of the Uterus	538	Nephrectomy for Uretero - vaginal Fistula	541
Cysto-fibroma of the Ovary	538		
Nerves of the Human Ovary	538		
Ovulation and Menstruation	538		

PÆDIATRICS.

Tracheotomy for Croup in an Infant	542	Spinal Meningitis and Ependymitis	544
Eighteen Months of Age	543	Digestive Disorders of Bacterial Origin During the Nursing Period	545
The Treatment of Whooping-cough	543		

PUBLIC HEALTH.

Weil's Disease	546	Etiology of Tetanus	547
--------------------------	-----	-------------------------------	-----

CONTENTS.

ORIGINAL COMMUNICATIONS.

	PAGE
Two Cases of Scleriosis. By WILLIAM PEPPER, M.D., LL.D.	439
Bone and Joint Disease. By ERNEST J. NEVE, M.D., F.R.C.S.E.	460
Surgical and Mechanical Treatment of the Deformities following Infantile Spinal Paralysis. By DEFOREST WILLARD, M.D., Ph.D.	470
The Treatment of Chronic Purulent Otitis Media by Excision of the Carious Ossicles and Removal of Obstructions in the Tympanic Attic. By C. J. COLLES, M.D.	477
Case of Epilepsy Cured by Antipyrine. By MCCALL ANDERSON, M.D.	485
Extensive Fracture of the Skull. By C. G. R. JENNINGS, B.A., M.D.	487

REVIEWS.

A Manual of Auscultation and Percussion. By Austin Flint, M.D.	490
On Severe Vomiting During Pregnancy. By Graily Hewitt, M.D.	492
Flushing and Morbid Blushing. By Harry Campbell, M.D., B.S. (Lond.)	492
The Technic of Ling's System of Manual Treatment as Applicable to Surgery and Medicine. By Arvid Kellgren, M.D. (Edin.)	494
The Philosophy of Tumor Disease. By C. Pitfield Mitchell, M.D.	494
The Treatment of Syphilis of the Nervous System. By Julius Althaus, M.D.	495
Diseases of the Eye. By Edward Nettleship, F.R.C.S.	497
The Biography of Ephraim McDowell, M.D. By Mary Young Ridenbaugh	497
Quiz Compend on Anatomy. By Dr. S. O. L. Potter	498

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

	PAGE		PAGE
Effects of Cocaine	499	Bites of Poisonous Insects	503
Artificial Salicylic Acid of Commerce	501	Guaiac as a Laxative	503
Chlorate of Potassium Poisoning	502	Treatment of Obstruction of Bowels	504

MEDICINE.

Cardiac Nerve-storms	505	Pulsus Bigeminus	510
Pulmonary Syphilis	505	Researches on the Extremes of Temperature Borne by the Leucocytes of Human Blood	511
The Phenyl-hydrazin Test for Sugar.	507	A Case of Mediastinal Tumor	511
Serum of Dogs' Blood	507	Hypertrophic Biliary Cirrhosis	512
Aortic Aneurism	508	Mercurial Stomatitis	512
Idioglossia	508		
Parasitic Bodies in Epithelioma	510		

SURGERY.

Tumors of the Male Breast	513	Complete Prolapse of the Rectum	516
Treatment of Stricture of Male Urethra	514	The Etiology of Secondary Infection in Wounds at the Base of Skull	517
Treatment of Tubercular Arthritis	514	Suture for Intestinal Anastomosis	518
Two Cases of Rupture of the Bladder	516		

March 21. Swelling decreasing. Feels better.

24th. Less œdema of the feet, but both hands and feet are somewhat swollen and indurated. Given pil. ferri carb. gr. ij, t. d.

31st. Feet continue to improve, but hands are still hard and enlarged. Spiritus juniperi comp. discontinued, and potas. iod. gr. x, t. d., substituted for it.

April 2. She has complained more of her hands since the storm of the past few days. They are somewhat swollen, with very little if any augmentation of temperature. The skin is of a livid red tint and is assuming a glossy appearance over the dorsal surface of the fingers and hands. The hands are painful to the touch, and are very hard. Movement of the wrist-joints and fingers is considerably impaired, apparently not so much from any real stiffness in the joint as from the binding of the indurated skin. In addition to this induration of the skin and superficial tissues there is an entire loss of the normal supple play of the skin upon the subjacent structures, it being now impossible to pinch up a fold of skin or to push the skin from side to side. This condition is evidently due to an agglutination of the superficial and deeper layers of the connective tissue.

6th. The hands and feet have both seemed slightly better for the past two or three days, but the change consists rather in her sensations and in a little increased range of motion than in any real improvement. To-day the same indurated condition of the superficial tissues has appeared in the face over each malar bone with slight prominence of the cheeks. There are no abnormal heart sounds present, and even the difference between the first and second sounds above noted is less obvious. There is a slight venous hum in the left jugular vein. The respirations seem to be normal. Appetite fair. Tongue slightly coated. No abdominal swelling.

10th. The induration of the cheeks seemed less, but toward night they returned to their former condition without heat, pain, or redness. The carbonate of iron and potassium iodide were continued, and vin. colchici rad. gtt. xv, t. d., added.

24th. The skin is noted as seeming a little softened, especially on the face.

29th. Improvement did not continue, the skin presenting the same indurated, resisting character around the ankles, on the hands, and wrists. Beside these parts and the surface covering the malar bones—on body, thighs, and anus—the skin and subcutaneous tissues are as soft as ordinary.

May 12. The induration on the face and around the ankles is rather less, and there is now scarcely any pitting on the ankles. The condition of the hands, however, is growing more marked. The enlargement of the hands before mentioned has gradually subsided as the hardening of the skin increased, until now the fingers appear to be thinner than they were before the onset of her trouble. She has lost, to a great extent, power of motion in the fingers, which are somewhat flexed, the skin over the joints being very tightly stretched and shining, while in one or two points minute ulcerations have appeared. The skin over the dorsum of the hand is shining and discolored, and the induration has extended up a short distance above the wrist.

Sensibility in these parts appears to be unimpaired. She does not suffer much pain although the affected areas are somewhat sensitive to

THE
AMERICAN JOURNAL
OF THE MEDICAL SCIENCES.

MAY, 1891.

TWO CASES OF SCLERIASIS.

By WM. PEPPER, M.D., LL.D.,
OF PHILADELPHIA.

THE cases here for the first time reported are chiefly of value from the long period during which they were under observation and from the fact that in both it was possible to make careful examinations *post-mortem*.

CASE I.—Bridget H., aged forty-two years, was admitted to the Pennsylvania Hospital on March 15, 1865. She was born of healthy parents, having, so far as could be ascertained by the most rigid inquiry, neither syphilitic nor tubercular taint.

She herself had possessed good health until two months before her admission to hospital, having steadily followed her occupation as housemaid. She is unmarried, and it is impossible to fix upon her the slightest suspicion of ever having contracted venereal disease.

Two months ago her present illness began with swelling of the feet. This was soon followed by an induration of the skin about the ankles to a slight extent. Recently swelling of the hands appeared. This swelling extends from the tips of the fingers to the wrist, being less marked than that upon the upper portions of the feet. The skin of the parts involved is tense, resisting pressure and not pitting at all. The induration is much more marked in the hands than in the feet, this difference having existed since the beginning of the attack. She has lost almost all her teeth within the past four years from gradual decay, but her gums are firm. She can assign no cause whatever for the appearance of her symptoms. Until the onset of this trouble menstruation was normal, but ceased when it began. She has never suffered any rheumatic pains. Her general condition upon admission was poor. She was anæmic, with pallid lips, feeble pulse, and intensified second sound of the heart. The urine was of acid reaction, its specific gravity 1022, and containing neither albumin or sugar.

She was ordered nutritious diet and spiritus juniperi comp. f 3ss, t. d.

general and local symptoms. Her emaciation and debility however increased so that before the close of the year she was compelled to remain in bed almost constantly. Premonitory symptoms of delirium appeared on about January 20, 1866, and within a few days she became completely out of her mind. Her delirium was not at any time violent—consisting in attempts to get out of her bed and wander about her room in search of imaginary persons—as, for instance, her mother, who had been dead for many years, but whom, she asserted, she frequently saw by her bedside. During this time there were no marked febrile symptoms nor any impairment of motility or sensibility. She still vomited frequently shortly after eating.

She never entirely recovered intelligence, and, although during the early part of March she would answer questions occasionally, failed entirely to recognize one of her former physicians. The induration and contraction of the hands progressed until the skin became involved up to the elbow—not, however, to so great an extent as before—while above the elbow it remained soft. The induration of the lower extremities had also extended, involving the lower half of the leg. At no part was the skin so dense and resisting, or the contraction so great as on the hands and wrists. During the last few weeks of her life there was considerable œdema of the ankles, in spite of their indurated condition. Early in March she began to fail rapidly, apparently from some intercurrent disease, and death occurred on March 14, 1866, just one year from her admission into the Pennsylvania Hospital and about fourteen months from the inception of her disease.

During the days immediately preceding death a partially gangrenous condition of the tips of several toes appeared, while in the upper extremities complete dry gangrene of the last two phalanges of the index-finger of the left hand occurred. Even at this final stage there was no ulceration of the indurated tissues. The small ulcerations, mentioned above as existing on the joints of the fingers, were scarcely more than abrasions, and, after throwing off repeated thin crusts, gradually dried up.

Of the *autopsy* the following notes were made: Body extremely emaciated and the dependent portions ecchymosed. There is very little *rigor mortis*. Hair very gray and falling. Teeth all absent but two. No enlargement of external lymphatic glands in any part. Blood too fluid, forming only very soft, dark, and small clots.

Spinal cord was not examined.

Brain: There is congestion of the vessels of the convexity, but the membranes are clear. The membranes at the fissure of Sylvius, particularly on the left side, are thickened and opaque, with a few small granules on their surface.

The velum interpositum and the membranes over the postero-inferior part of the brain near its fissures are also thickened and in places somewhat granular, while the arachnoid along the anterior surface of the medulla is opaque and shows a few small whitish specks or granules underlying it. There are, however, no evidences of recent inflammation, there being very little effusion at the base and no abnormal effusion into the ventricles. The brain substance itself is of fair consistence and not congested. Upon removing the calvarium a small amount of serum escaped, but it was clear and trifling in quantity.

The granules above mentioned had undergone calcareous deposition

pressure, and when, from apprehension that some of the loss of power might be due to false ankylosis, forcible passive motion of the wrist and fingers was attempted, it gave exquisite pain and did not the slightest good.

Her general health is very good; but her hopes of recovery have pretty much disappeared, and she is dejected, somewhat irritable, or even hysteroid at times. She complains of great insomnia.

16th. The local application, now applied since last note, seemed to have done no good, and was, therefore, discontinued, and baths of sulphuret of potassium tried. Internally she has been taking syrup. ferri iod. freely with cod-liver oil.

19th. Instead of the iron preparation she was now put upon a mixture of potas. iod. gr. v, hydrarg. chlor. corros. gr. $\frac{1}{2}$, syr. sarsaparill. comp., f 3ss; t. d.

26th. No improvement whatever having taken place in the hands, although the feet and face were very slowly improving, the oil and mixture of May 19th, as well as all local applications were discontinued and she was ordered liq. potas. arsenitis gtt. v, t. d. After taking a few doses of the arsenical she was seized with symptoms of gastro-intestinal irritation—frequent vomiting and purging, burning and stinging pain in the epigastrium. The drug was immediately stopped, and castor oil, demulcents, and counter-irritants used. She slowly regained her previous condition, her stomach becoming tranquil, and her digestion improving under the use of tr. cinchon. comp. The condition of the hands and wrists remain exactly the same.

July 20. The arsenic was resumed in three-drop doses, largely diluted.

After continuing its use for nearly a week the drug had to be discontinued owing to the recurrence of her gastro-intestinal symptoms. She was then put upon a simple carminative mixture.

August 9. She still suffers a great deal from gastric distress with quite frequent vomiting. Has lately been complaining severely of pain in the shoulders, apparently in deltoid and trapezius muscles, for which hypodermic injections of morphia were given.

September 5. She is no better, continuing to vomit frequently at times for days consecutively. She also complains of a gnawing, burning pain in the left hypochondrium over the stomach. Her appetite is very poor. The matters vomited invariably consist simply of the food taken. Her bowels are regular. For some weeks past she has been emaciating quite rapidly. There is no sign, however, of cancerous disease of the stomach or pancreas—the epigastrium presenting no tumor. She still complains of pain in the shoulders, of depression of spirits, and of insomnia, which scarce any remedy will relieve.

The induration of the skin over the hands and the lower part of the forearms, with contraction and thickening of the fingers, is even more marked, and power of motion more impaired than formerly. The induration of the face has almost disappeared, and the œdema of the ankles is very slight, only a moderate feeling of induration remaining.

At this date she was transferred to the Philadelphia Hospital, where she was under the care of Dr. John Parry, who kindly supplied me with the remaining notes of her case up to the time of her death.

For several months after her admission to the Philadelphia Hospital she remained in very much the same condition, both as regards her

of induration of the skin half-way up to the knee. [Dr. Parry stated that this was less than before death.]

The upper extremities are in the condition previously described, the induration reaching almost to the elbow and still marked, although less so than before death, while the livid redness of the skin then seen has disappeared. The wrist is forcibly extended and the fingers partially flexed. All of the tissues are much contracted and thinned, having a smooth, glazed feel and appearance. Gangrene of the index-finger exists, as described in the notes taken during life. The condition of the vessels and nerves could not be determined owing to the lack of permission to dissect them out; but pieces of skin were removed from the palmar surface of the forearm above the wrists, the parts being removed down to the bone.

The muscular structure is not materially changed, although a little pale and containing an unusual amount of interfibrillar granular matter. The skin itself is slightly thickened, but does not feel so dense as before removal, the cause of the induration and contraction being evidently the condition of the subcutaneous connective tissue.

This tissue is dense, of a pearl-gray color, with a smooth, almost colloid appearance. There is no line of division between the superficial and deep layers of connective tissue, but from the skin down to the tendons and muscles there is a uniform layer of the above appearance, dense and measuring about one-eighth of an inch (in places, probably not more than a twelfth) in thickness.

On examining a section the epidermis appeared healthy, the ducts were pervious, and the hair-follicles distinct. The hairs appeared brittle and broken. The subcutaneous tissue was dense, and consisted of closely interwoven bands of fibrous tissue. There were no exudation cells seen. The connective-tissue layer was spotted with points of adipose tissue, which, however, did not form anything like a continuous layer. It also seemed that the deeper layer of the derm had an unusual amount of fibrous tissue.

CASE II.—Michael M., aged forty-two years, came under observation August 21, 1867. He was a native of Ireland, but has been in America twenty-four years. Both his parents were dead; his mother was thought to have died of phthisis. He had six brothers and sisters, all of whom were living and well. His principal occupation had been that of a hack driver, in which he had been much exposed to cold and wet, but had enjoyed excellent health.

On the evening of January 9, 1866, a day when the mercury fell to 9° F., after driving all day with a pair of new and rather tight gloves on, he noticed that the ends of his fingers felt cold and numb. On dipping them into cold water a burning sensation was felt, and the same sensation was caused by approaching the fire. His companion had his ears severely frosted in the ordinary way and soon recovered.

The patient's fingers did not swell and become hot on the following day, but instead remained cold at the tips, with impaired sensibility and a feeling of numbness, and with a burning sensation for two months, during which time he continued his work without interruption. At the end of this time both hands and arms began to swell from the tips of the fingers almost to the elbows. The swollen parts were unusually white, hard, not pitting on moderate pressure, but when indented by firm pressure a slight mark would remain for some time. The surface was

in part, and under the microscope did not give perfectly satisfactory appearances of tubercle, there being but a few granular corpuscles mixed with granular calcareous matter and fibrillated tissue. The appearances, however, rather favored the view of retrograded tubercular deposit. It is to be much regretted that an examination of the spinal cord could not be made, as the opacity of the membranes along the medulla spinalis so far as it was removed, would tend to render the view of spinal lesion probable.

Thorax: The right lung is tied down by close chronic adhesions. In several places these adhesions contain little granules, which however are highly pigmentary. (The microscope showed these to be merely pigment and granular fibrous stroma, possibly originally of tubercular origin.) The lung itself is dense and congested but contains no tubercles. Along the bronchial tubes here and there are seen small pigmentary granules.

The left lung is compressed by effusion into the pleural sac, but is itself healthy save for marked congestion and condensation of its tissue. The pleural cavity contains about three pints of yellowish serum, rendered turbid by numerous flocculi of lymph. The heart is healthy so far as its muscular substance and valves are concerned. The pericardium presents signs of recent inflammation, containing shreds of lymph and several ounces of turbid serum. The membrane shows several patches of thickening and opacity.

The bronchial glands are much enlarged, forming tumors one and one-half inches long, and firm. On section they are found to contain much pigment and little collections of whitish granular matter, many of the granules having undergone calcareous degeneration. These appeared to be retrograde miliary tubercles.

Abdominal contents: The stomach is distended, its mucous membrane somewhat thickened and discolored, but not ulcerated. The intestines are normal.

The liver is rather small, quite smooth on its surface. On section it presents marked nutmeg appearance from hepatic congestion. The gall-bladder is moderately full and contains one stone of about the size of a large pea and composed of translucent cholesterine. There is no hepatic cirrhosis.

The spleen is firmly adherent to the left edge of the left lobe of the liver, being drawn from its place by strong adhesions. The capsule is greatly thickened and very irregular, either forming whitish depressed cicatricial points or strongly adherent as mentioned above. It has evidently undergone a severe attack of inflammation of its investment. The spleen is small, of unusual shape, its tissue softened, its pulp of a grumous tending to reddish-slate color. There is a supernumerary spleen in the normal position, of about the size of a cherry with smooth capsule and firm healthy tissue.

The kidneys appear healthy and there is no disease or unusual condition of the supra-renal capsules. The inguinal, lumbar, and mesenteric glands are not enlarged.

The ovaries are full of cicatrices. The uterus is of normal size, the os is virgin, and there is present a slight cervical leucorrhœa.

The lower extremities present a few points of incipient gangrene at the tips of the toes, some œdema of the ankles, and a moderate amount

The induration on the humeral regions has also diminished during the past four months and is now limited to the external aspect of the arms, and is much less marked even here than on the forearms.

The skin on the forearm is markedly indurated, and the entire forearm is much reduced in size.

The skin of the hands is very hard and immovable, as though united with the deeper structures. It is also a good deal discolored, that on the back being principally of a dull-whitish color, while the fingers are brownish. The fingers are permanently semi-flexed and can neither be completely flexed nor extended; there is, however, no ankylosis of any of the joints nor erosion of the cartilages, but upon forcibly moving the fingers the flexor tendons give a sensation of rubbing and creaking through their respective sheaths. The hands also feel decidedly cold. The epidermis has twice separated from the hands, owing, he believes, to irritating applications.

The skin of the abdomen is slightly indurated: that on the back being the only part entirely free from the disease.

There is a moderate degree of induration of the skin of the feet, which, however, becomes much more marked between the ankle and knees, diminishing again from the knees up to the hip.

There is no ulceration on any part of the body, although the skin over several prominent bony points, especially the internal condyles of the humeri, and some of the phalangeal joints of the fingers, is very tightly drawn and glazed.

Sensation to pain is acute, and common sensibility appears good everywhere; there is no analgesia.

For the past seven months his bowels have been somewhat constipated, and during much of this time he has vomited one, two, or three times daily. The vomiting occurred soon after eating, the matters rejected consisting principally of the food taken. He has noticed also six or seven times that the matters vomited resembled coffee-grounds, but he has never seen any blood in them. For the past four months he has had a good deal of cough; which has been most marked at night when occasionally he had violent paroxysms. The cough has been attended for two months past with mucous-purulent expectoration, and a few days before admission he raised a little blood-tinged mucus for the first time.

Physical examination revealed good resonance on percussion over the entire thorax. Respiratory murmur feeble postero-inferiorly, with prolonged expiration and a few dry râles; elsewhere it was normal. There were also a few old friction sounds.

The apex beat of heart was at the sixth rib, three-fourths of an inch to the left of the nipple. There was no considerable increase in the area of cardiac dulness. The cardiac sounds were normal, save that the first sound at the apex was rather heavy and prolonged. Pulse regular, 88 in sitting posture after physical examination. The tongue was pale, but moist and clean. He is not able to protrude it, nor can he open the mouth widely. There is no gingival margin in the gums; nor any induration of the mucous membrane of mouth. Ordered ung. iod. comp., eerat. simp. aa. Apply to surface twice daily. R. Potass. iod. gr. v, ext. dulcamara fʒss, M.; t. d.

This treatment was continued for a few days only, as he insisted upon leaving the hospital to return to his wife and children, and for the next two months he was without medical attendance.

smooth and somewhat shining. Sensibility was blunted, but not destroyed; no subjective sensations present; cold did not produce a sensation of burning above the fingers. This swelling continued for two months and then began to abate. The hands, that had been almost immovably fixed in a semi-flexed position, became somewhat more supple and the skin rather less pale. This contraction continued until the arms became much reduced in size. About seven months after the first symptoms, he noticed induration over the lower part of the sternum, and began to feel stiffness of the upper part of the trunk, so that he could not stoop. Soon after this he was obliged to abandon work.

The affection of the skin of the thorax was preceded by induration of the skin of the humeral regions, which became very hard and swollen like that of the forearm. The induration extended from the sternal region over the whole anterior part of the thorax and up over the clavicle and on to the neck. Soon after he noticed it in the lower extremities, affecting the feet first, but to a less degree than the skin between the ankles and knees.

The capillary circulation seems to have been much interfered with from the beginning. In January, 1867, one year after inception of the disease, he accidentally cut his finger, when to his surprise no blood flowed.

About three months before admission he began to have a feeling of creeping under the skin of the forehead and of tingling of this part, which was worse at night, causing him to scratch the surface continually. This feeling had been present in the arms, but no where else. The induration has since then involved the skin of the entire head and face down to the level of the mouth.

When first seen, August 21, 1867, his condition was as follows: There is marked induration of the skin of the whole head and face from the vertex down to the level of the mouth, the constriction and hardening being most marked over the frontal protuberances, malar bones, and the bridge of the nose. It is still possible to slightly indent the skin on the forehead, and such a mark remains a long time. The scalp and skin of the face is of a peculiar white, waxy appearance, with the cutaneous veins distinctly visible. The temporal arteries can be felt pulsating, though their calibre seems small.

Over the entire anterior part of thorax the skin is indurated and more white, waxy, and shining in appearance than elsewhere. It feels as though tightly stretched over the ribs, and so great is the tension that when he draws back the scapulæ and arms he says it seems to him that the skin will rupture over the sternum. The induration and constriction do not extend beyond the lateral aspect of the chest, but extend up over the clavicles for a short distance on to the neck. The skin over the shoulders is also indurated, and when the deltoid muscles are contracted and the arm raised there is an appearance, for two fingers'-breadth below the acromion, as though the muscular substance of the deltoid was much atrophied, leaving merely the fibrous bands connecting with the bones, as though the deltoids took their origin by numerous converging tendons.

At one time he was unable to raise his arm more than 45° from his body, and would then feel a sense of constriction in the fold of the axilla, but this has of late diminished, and he is now able to raise his hand to the head.

contracted, hard and pale. The mucous membrane of the oral cavity does not appear to be involved.

The skin over the mastoid processes seems very thin and hard. The ears cannot be moved so freely by the fingers as usual owing to the condition of the surrounding parts. The external ears are, however, certainly the least affected of any parts of the head, and it is indeed only the lobes which can be said to be at all involved, the affection here amounting to a little rigidity.

The skin in the armpits is of a deeper color than natural, and there is a brownish-yellow mottling over the lateral regions of thorax and abdomen. The skin on the inside of the arms is also of abnormally deep color down almost to the elbows. There is scarcely any induration of the skin of these parts. The hands present the same brownish-yellow mottling, which is most marked on the back of the left hand, which is also softer and more movable than the right. The central part of the back of the right hand is still very pale. The capillary circulation of the skin appears very sluggish. He can now raise his arms to the level of the shoulders, and place his hands on his head.

The following measurements were accurately taken :

Around right wrist, 6 inches; around first phalanx of right index finger, 3 inches; around second phalanx of right index finger $2\frac{9}{16}$ inches; around right forearm, 3 inches; below olecranon, $7\frac{5}{8}$ inches; around right arm, at insertion of deltoid, $7\frac{5}{8}$ inches; around neck, on level of fifth vertebra, $11\frac{1}{2}$ inches; around neck, on level of sixth vertebra, $12\frac{1}{4}$ inches; around calf of right leg, $11\frac{5}{8}$ inches; around right ankle, $8\frac{5}{8}$ inches; extent of ability to open mouth, $1\frac{1}{2}$ inches.

He was now ordered pulv. opii gr. $\frac{1}{2}$, quiniæ sulph. gr. j; t. d.

November 11, 1867. Has continued above treatment, and feels in every way better. The hands are a little more supple; he can move his arms rather more freely and open his mouth a little more widely. He walks slowly, but can accomplish considerable distances without much fatigue.

On pricking one of his fingers, a drop of blood was obtained, though with more than natural difficulty. It appeared to cause him unusually great pain. (The sensation felt in sticking the pin into the flesh was as though it entered a dense lardaceous tissue.)

He still suffers from gastro-intestinal disturbance, and vomits almost every day and on some days several times. The vomiting rarely, if ever, occurs spontaneously, but follows eating at intervals of from twenty minutes to several hours. The matters vomited consist of the ingesta with gastric mucus. There is also belching and a foul taste in the mouth. The bowels are costive, for which he uses senna and manna once in two or three days, which operate rather freely even in moderate doses.

Urine has been less free, not requiring him to leave his bed more than once in the night.

The powders of opium and quinia were discontinued, and he was ordered subnitrate of bismuth gr. v, t. d.

21st. One week ago he raised about two fluidounces of pure blood, probably from the stomach, and since then has been troubled with a sense of constriction about the chest and quite frequent cough, with mucoid expectoration. His strength, however, is rather improved; his appetite is better and his dyspeptic trouble is less, though he still suffers with gastric distress.

On October 6, 1867, he was found in much the same general condition, though in some respects he was decidedly improved. Appetite not strong, but vomiting much less frequent and little or no eructation of gas. Bowels costive, requiring laxatives every second night; he uses senna and manna, which operate very nicely. He has considerable thirst, especially at night, when he rises several times to drink. He also passes more urine than natural, and is disturbed on this account several times during the night; the urine is, however, quite healthy, containing neither albumin nor sugar. He has some cough during the early part of the night, with tough muco-purulent sputa. He is much stronger than previously, and is now able to walk several miles without much exertion or fatigue. His weight before his sickness was 185 pounds, three months ago it was 102 pounds; at present it is 115 pounds.

Most of the surface feels of a comfortable temperature; he always feels cold after the slightest exposure in the last two phalanges of all his fingers, and these parts then become purplish.

The surface was at first unnaturally white, and the face is still pale, but the neck which, three months ago, was white and so hard that the skin could not be raised in folds, has now become softer and darker colored, having a brownish tint over the whole front part. This coloration is not uniform but is interrupted by little patches of light-colored skin; in some places the pigment seems deposited on the ridges of the skin alone.

When the head is flexed the skin of the front of the neck is quite pliant and movable, but when extended it is seen to be very tense and numerous thin bands can be seen passing from the clavicles and sternum to the lower jaw. At the same time the skin for an inch and a half above the sternum becomes rough and nodulated as though crossed by subcutaneous bands which prevented it from stretching equally and smoothly. He is quite bald over the vertex, but this has been the case for some years, and the hair in other parts does not seem at all inclined to fall out.

The scalp is very white, glistening, and waxy in appearance, it is very slightly movable (cannot be thrown into wrinkles), and feels thick, hard and waxy. Firm pressure with the finger causes a slight indentation, as in firm wax, which remains a long while, at least for two hours.

The skin of the face is uniformly affected. Over the forehead it is drawn tightly, glistening with a waxy lustre, and cannot be thrown into wrinkles by any effort at frowning nor at all pinched up in folds, so slightly movable is it over the bone. The skin over the malar bones is also tightly drawn and indurated.

The alae of the nose are thin and the nose has a pinched appearance. The angles of the mouth are somewhat retracted and the upper lip drawn up, partly uncovering the teeth. The lower lip and region of the chin are also hard. The upper eyelids are decidedly indurated, and it is only with effort that he can cover the eyeballs. In this condition the face is almost immobile. His efforts to smile produce no wrinkling of the cheeks or movement of the skin over the malar bones, but merely a little additional separation of the lips. The expression of the face when the eyes are closed is that of a death's head with a skin of peculiar glistening, waxy appearance, stretched tightly over it. The tongue does not seem involved, though its movements are not very free. The gums are

twice daily, the vomiting occurring a few hours after meals. The matters vomited consist of gastric mucus with undigested food, and contain neither blood nor *sarcinæ ventriculi*. Bowels still costive. Induration of skin about the same. Emaciation not progressing.

February 27. In much the same condition as regards the degree of emaciation, induration, and freedom of movement. There seems to be some decrease in the discoloration of the skin, especially on the hands and arms. He occasionally sweats. Temperature of surface usually seems normal; but during the late intense cold he has required much artificial heat. Appetite poor, and he still suffers from gastric flatulence, burning epigastric pain which does not extend through to scapula, and frequent, irregular vomiting. The matters rejected are the same as before.

For about four weeks he was placed on a diet of two pints of milk daily with a little lime-water, but this afforded no relief. He has now taken nitrate of silver for eight weeks, as first, gr. $\frac{1}{8}$, t. d., and for past two weeks gr. $\frac{1}{4}$, t. d. This remedy has certainly not relieved the gastric symptoms, but on the contrary, after the latter large doses he had marked burning pains and vomiting was more frequent. For a few days after stopping it he scarcely vomited at all. There has been for some months past slow progressive diminution in the induration, though so slight as scarcely to be positive, and as this has not been more marked during use of nitrate of silver, it is, on the whole, doubtful whether this remedy has been of any service at all. Stopped nitrate of silver and ordered liq. potass. arsenitis gtt. v, t. d.

March 7. After continuing this for eight days he became universally œdematous, the face more swollen than the extremities. There was marked dyspnoea, with almost complete extinction of the voice and sense of constriction in the larynx, probably from œdema of glottis and larynx. There was also marked gastric distress and almost constant vomiting. He was not seen on the day when these symptoms were worst; the arsenic was stopped and the œdema rapidly subsided. He also used for a day or two diuretics and strong alum gargles.

Unfortunately, the urine could not be obtained until twenty-four hours after the arsenic had been stopped, and when the œdema was already diminishing, but at that time no albumin was present.

After this unfortunate attack he continued to be troubled with spasmodic cough and very frequent vomiting, which were greatly relieved by spiritus chloroformi. This soon lost its controlling power, however, and was stopped; and for some time he took merely occasional laxatives and small, frequently-repeated quantities of milk and lime-water.

May 1, 1868. Since last note his general condition has been growing steadily worse and his strength failing. The induration has, however, remained about the same, though he says he has more power of movement. There has been little or no loss of hair since previous note.

The tissues of the neck are still indurated, and when the head is thrown back the same subcutaneous bands can be seen as previously. There is some brownish-yellow mottling of the skin of this part.

The induration is very marked over the inner half of the clavicles and the whole sternal region down over the epigastrium. There is no discoloration of the skin here, but there are two small oval patches

December 1. Vomiting so much relieved that bismuth was stopped and he was ordered ferri iodid. gr. ij, t. d.

10th. A crop of vesicles broke out without any apparent cause on the left hypochondrium and rapidly spread, assuming the form of herpes zoster, and extending in the course of a week more than half around the trunk, forming a band nearly four inches wide. The vesicles were flattened, filled with turbid serum, and were seated in irregular clusters on a livid-red base. The eruption itched very severely, and he believes that its appearance was attended with relief to gastric symptoms.

The pills of iodide of iron were continued, a laxative pill of ext. coly-cynth. comp. and ext. gentian ordered, and cerate zinci carb. applied to the eruption, which rapidly improved, and was quite well in less than three weeks.

January 2, 1868. Has been very unwell for several days past. The laxative pills have been insufficient, and he has been obliged to take purgative doses of senna and manna. Appetite has been very poor, and he has suffered severely with flatulence and vomiting. The vomiting does not occur until an hour or more after eating, and is accompanied by the eructation of very large quantities of gas of not very offensive character. At times this eructation is the only phenomenon and affords great relief. His tongue is rather pointed and its surface rough, but not actually furred. There is quite marked tenderness over a space about three inches in diameter, extending from the middle of the epigastrium toward the left.

The skin of the abdomen is indurated and the abdominal walls are quite hard; cannot be raised in folds and imparts an inelastic, leathery sensation. There is no positive tumor or localized induration in the neighborhood of the pylorus, though palpation is rendered difficult by the condition of the abdominal walls. He is progressively emaciating, and the induration of the surface is certainly little, if any, less marked. The skin is now much discolored in places by yellowish-brown spots, roundish, of small size, rarely exceeding two lines in diameter, and in very many instances seated around the orifices of hair-follicles. This is marked over the inguinal and iliac regions, extending also on the lateral parts of the abdomen as high as the ribs. On the thorax the skin has a white, waxy appearance; on the hands and forearms, again, it is much discolored. On the hands alone this discoloration takes the form of irregularly shaped, brownish blotches. This discoloration of the skin is a phenomenon entirely due to the cause of the disease, as previously to its beginning his surface was quite white. The patch of herpes zoster is quite well.

The hair on his head is not abundant and has not been for many years; it is quite long, straight, and black, and can now be plucked out with certainly less than the usual amount of force. The hairs on the forearms have, as is often seen, a broken, distorted appearance, which seems even exaggerated in this case; and here also they can be readily plucked out, and with production of scarcely any pain.

The temperature of the surface, excepting the tips of the fingers, is apparently normal. For the past two or three days he has sweated considerably. The iodide of iron was stopped on account of the extreme gastric distress, the laxative pills continued, and he was ordered argenti nitrat. gr. $\frac{1}{8}$, t. d.

25th. Has continued use of nitrate of silver since last note, but without any benefit to gastric symptoms. He still continues to vomit once or

with those described above were found, there appeared to be here also an excess of fibrous tissue.

So far as could be determined from these examinations, therefore, it seems as though comparatively slight and unimportant changes had occurred in the ganglionic nerve cells; while the neurilemma of the nerve fibres traversing the ganglion and the intervening connective tissue had undergone morbid increase. It will be seen that this corresponded with the condition of the nerve trunks elsewhere.

Right phrenic nerve was apparently unaltered.

The pneumogastric was decidedly more rigid, its fasciculi strongly adherent to each other, and on examination there was found to be an excess of fibrous tissue intervening between the nerve fibres. The myelin appeared in very tortuous lines, and nerves were highly granular.

Several portions of nerve from the right brachial plexus were examined and found to present a similar, unnaturally rigid condition, with excess of fibrous tissue on microscopic examination.

A section of the right median nerve extending from the carpus one and a half inch upward was removed. This was quite rigid and hard; a condition which was still better appreciated on rubbing a transverse section. The sheath of the nerve was not materially thickened; the fasciculi were very firmly adherent to each other, and measured on an average one-thirtieth to one-twenty-fifth of an inch. The color of the nerve after removal of its sheath was a pure white.

Each fasciculus consisted of a sheath of neurilemma composed of dense connective tissue, and a core of less pure white color about one-fortieth of an inch in diameter; the thickness of the sheath thus amounting to rather more than one-quarter that of the whole fasciculus. On carefully teasing out this central portion there was still found a moderate amount of fibrous tissue interposed between the individual nerve fibrils, as though from thickening of their neurilemma. The double contour of the fibrils was preserved; the myelin readily broke up into drops, and both the axis cylinder and white matter of Schwann were distinctly granular. In one or two places groups of large nucleated cells resembling fibro-plastic cells were seen in inter-fascicular tissue.

The examination of all these parts of nervous tissue was made about twelve hours after removal from the body, having been kept in the meantime in water.

Lymphatic glands: The cervical lymphatic glands were all unusually hard. The upper were but slightly if at all enlarged, and presented microscopically the normal cells of the gland, with a large number of fusiform fibre cells. Toward the base of the neck, however, several glands were found, and especially on the right side, which were very much enlarged and of an almost cartilaginous hardness. There were two or three of these adherent together, forming an obtusely pyramidal mass about one and one-half inch long and three-quarters of an inch in thickness. On section this showed a very large amount of pigmentary deposit, with numerous quite thick trabeculae of fine fibrous tissue traversing its substance, some of which were the thickened capsules of the adherent glands, but others were newly formed and due to a very great increase in the normal stroma of the gland. No other glands were found much enlarged, though all that were observed seemed more firm than usual.

Muscular system: Portions of the heart, the right pectoral muscle, the

about one-half by one-third of an inch below the right sterno-clavicular articulation, where the skin is dead-white.

The condition of the face is the same as before noted, save that he can open his mouth more widely.

The anterior surface of the abdomen is decidedly affected throughout its entire extent. The skin cannot be pinched up from the muscles, but one is required to grasp a large fold of the entire thickness of the abdominal wall. It has not, however, advanced to the extent of inducing any manifest constriction of the abdomen. There is very marked yellowish-brown mottling of the skin on the antero-lateral parts of the abdomen, extending down over the iliac regions on to the outside of the thighs. The spots are quite closely placed, and vary from small points to patches one-third of an inch in diameter. There are no patches of dead-white color on this part of the body.

There is rather more power of movement of the arms, and he can now readily place his hands upon the head, though the forearms are constantly flexed at an angle of about 40° with the arm from tension of the skin above the elbows. He is able to flex them more than this, but cannot extend them further.

The deltoid muscles are much atrophied, and when the arms are raised the same tense bands are seen starting from the acromion, as though the muscular substance was almost removed for one and one-half inches below it. The skin over the shoulders is indurated.

The skin of the humeral regions is but little affected, most so on the antero-external aspect. The discoloration already noted on the inner surface and in the axillæ still continues.

More marked induration begins on the forearms and extends, constantly increasing, down to the tips of the fingers. The deep structures of the forearms are evidently much atrophied. The induration and constriction are extreme about the wrists, and there is scarcely any mobility of the hands upon the forearms. The tendons can be felt to move with difficulty, and a rough rubbing through their bursæ under the capsular ligament. The hands are shrunk and have a waxy, shining appearance; the fingers are constantly separated from each other and about half flexed. Some motion still exists in the metacarpo-phalangeal joints, but scarcely any at the inter-phalangeal. The skin over the hands and fingers is hard, smooth, thick, and absolutely immovable over the bones; over the phalangeal joints it has a somewhat translucent appearance.

The skin on forearms and back of hands presents a marked yellowish-brown mottling; over the fingers it is of an almost uniform brownish tinge, excepting a few white spots such as below described; on the palms of the hands it is of natural color and merely anæmic. The discoloration is much more uniformly dark on the back of the left hand, with fewer white spots. The white spots alluded to are placed as follows: There is an oval, slightly depressed patch, about one and a quarter inches long by half an inch wide on the posterior surface of the right forearm; there is another similar large patch over the palmar surface of the right carpus, and a third patch, one inch in width, is seated on the back of the right hand just above the ends of the metacarpal bones of the middle and ring fingers.

The skin on all these patches is dead-white in color, smooth and waxy-looking. In at least one of them it appears somewhat depressed below the surrounding skin. It is very thick and hard, but there is neither

The radial artery was, on the other hand, so much compressed by the dense fibrous tissue in which it was imbedded that its calibre did not exceed one-thirtieth of an inch. The walls themselves were slightly rigid, and on examining the lining membrane it was found to be distinctly rugous and thickened, corresponding to Rokitansky's hypertrophy of the lining membrane of vessels. No atheromatous spots were seen in the small section removed.

The circulation through the part examined must certainly have been very much interfered with, and, in all probability, as the induration was increased for a short distance below the point from which the skin was removed, its calibre was almost obstructed further down.

Thorax—Lungs: On the right side lung closely adherent by strong, old bands, some of which were œdematous. The lung itself was somewhat œdematous, but presented no organic disease of its texture.

The left pleural sac contained about one quart of turbid serum, discolored with blood; the lung was carnified and non-crepitant from pressure. Both layers of pleura, but especially the parietal, were slightly roughened, thickened, and of a slate-color, with scattered ecchymotic points. There were a few small sub-pleural fatty tumors projecting into this pleural sac.

Abdomen: The peritoneal cavity contained a very small amount of serum. The peritoneum was everywhere smooth and glistening, but its parietal layer appeared more whitish and opaque than usual; and, on removal, portions of it seemed somewhat thickened. There were no false adhesions.

The *omentum* was much shrivelled and contained very little fat.

The *stomach* was contracted and felt unusually firm. On opening it about four ounces of grumous semi-fluid matter escaped, which did not appear to contain much blood. The walls were apparently slightly thickened, especially the subserous and muscular coats.

The mucous membrane over the pyloric half of the organ was slate or chocolate-colored, with numerous ecchymotic points; the rugæ not hypertrophied, but at least six very small, shallow ulcers, with irregular walls and dark, bloody bases, were found on the summit of these folds. No obstruction of pyloric orifice.

The greater part of the *small intestine* was contracted and apparently healthy, though not opened; the duodenum, however, was distended with a grumous, chocolate-colored fluid. Its walls were not materially thickened.

The *pancreas* was rather large, and unusually hard.

The *liver* was enlarged, and especially in its left lobe, which extended across the epigastrium and reached two and one-half inches below the xyphoid cartilage. The entire organ was very heavy, and had a very unusual hardness and elastic resistance. Its capsule was smooth and slightly thickened, and the surface faintly granular, as seen through the capsule. On section, the organ was found gorged with dark fluid blood, which poured freely from it, leaving a moderate degree of nutmeg-congestion. The section was slightly granular, and very hard; the color had in parts a yellowish tinge.

On microscopic examination the cells were found to contain an excess of oil globules, and there was also too much free fat; but the outlines and nuclei of the cells were in nearly every instance well preserved. There was moreover marked increase of fibrous tissue and fibre cells.

right crus of the diaphragm, and muscles of the right forearm were removed for examination.

Heart presented a moderate degree of eccentric hypertrophy. The right cavities were distended greatly with fluid dark blood, which was so frothy from decomposition as to render the right auricle slightly tympanitic on percussion. The left cavities were moderately firmly contracted, and contained a small amount of fluid blood. The muscular structure was not so red as normal, and there was one part of the anterior wall of the left ventricle about one inch long and involving fully the inner half of the thickness of the wall, which presented a distinctly grayish, fibrous appearance. The endocardium was nowhere noticeably thickened, and all the valves were apparently competent, the only abnormal appearances noticed being a few atheromatous patches on the aortic leaflets. On microscopic examination the muscular fibres were found to have undergone positive, though not advanced, granular degeneration; and at the fibroid patch above described there was a marked excess of fibrous tissue present.

The other portions of muscle examined all showed a slight degree of granular change, with in places an abnormal amount of fibrous tissue; the muscular fibrillæ also showed a marked tendency to break up into longitudinal dotted filaments. The increase in fibrous tissue appeared to result from a thickening of the sarcolemma and encroachment on the sarcous material.

Vascular system: The aorta presented a good deal of atheromatous disease throughout the arch, but this became intensely marked in its descending and especially in its abdominal portion. Here it formed a widely patulous, rigid tube of unusually large calibre. On section, its walls were found much thickened, varying from one-tenth of an inch in descending thoracic to one-fifth of an inch in abdominal portion. This thickening affected all the coats, the external being very dense and thick, the middle in places measuring one-sixteenth of an inch in thickness and presenting very numerous and large atheromatous patches. Some of these were soft and almost diffuent, others of fibroid consistency, while in many calcareous formations had occurred. The internal coat was in places puckered or in folds, and in others presented irregular yellowish-white elevations at the seats of the atheromatous deposits. It was much thickened and brittle, and could be easily stripped off in quite long shreds by the forceps. This atheromatous condition was traced in a quite marked degree throughout the primitive and external carotids, but did not seem to have at all reduced their calibre. It had, however, led to constriction of the origin of some of the vessels arising from the abdominal aorta, that of the inferior mesenteric artery in particular being extremely narrowed, while just beyond this the vessel presented an almost aneurismal dilatation. The walls of the right renal artery were also very much thickened at the origin of this vessel. The arteries of the extremities could not be examined with the exception of the right radial and ulnar. The lining membrane of the heart and large arteries was deeply stained red.

The ulnar artery was of fair size, the surrounding connective tissue too dense, but not so much so as to compress the vessel much. There was no noticeable change in its walls, the lining membrane merely appearing a little wrinkled. As will be hereafter detailed, the skin on the ulnar side of the carpus was comparatively little affected.

so marked that over these latter bones it required dissection with a scalpel to separate it. On section the skin and subcutaneous tissue appeared as a dense layer about one-sixth of an inch thick. On closer examination the cuticle and derm did not form more than one-half of this layer, the under half being formed of the condensed and hypertrophied connective tissue. The section of this showed in places a rather fine network formed by bands of dense fibrous tissue, in the meshes of which small patches of fatty tissue could be detected; in other places the fat was entirely absent, and the tissue composed entirely of dense fibrous bands, closely apposed. In drying the skin here formed a horny layer one-fifteenth to one-tenth of an inch thick. On microscopic examination the cells of the cuticle presented ordinary appearances, forming a rather thin layer. The deeper part of the section presented a dense fibrous structure, with here and there in the subcutaneous portion little patches of fat globules. The white fibrous tissue was so exceedingly close and dense as to render it very difficult to distinguish the vessels or nerves. There was also a considerable amount of elastic tissue in large branching fibres. The hair bulbs in this part were few in number, but appeared to be healthy; one or two tortuous sweat ducts were also seen, obscured by the dense surrounding fibrous tissue.

Sections made after drying the skin were soaked in solutions of chromic acid and glycerin after Beale's method and in solution of chloride of gold.

The skin of the abdomen was somewhat softer; the difference consisting chiefly in the state of the subcutaneous tissue. The cuticle and derm here formed a layer about one-twelfth of an inch thick as over the sternum, but seemed of rather less dense consistence. In the subcutaneous tissue the increase in fibrous tissue though marked was very much less than in other places. It formed firm white bands, some of which ran parallel to the surface, while others ran vertically from the under surface of the derm, thus dividing up the subcutaneous fat into rather small patches. This was, however, succeeded by a very dense fibrous layer, one-sixteenth of an inch thick, immediately in contact with and quite closely adherent to the abdominal muscles.

The yellowish-brown spots described as being present over the abdomen seemed to depend in every case upon a deposit of pigment around the base of a hair.

The skin on the palmar surface of the right carpus presented even more marked changes.

Over the ulnar half the skin was uniformly colored of a brownish hue; it was very dense and hard, the thickness of cuticle, derm, and subcutaneous tissue being about one-seventh of an inch. The subcutaneous fat, which was present in small patches a little higher up, disappeared at the carpus. The adhesions between the under surface of derm and subjacent tissues were somewhat too dense. The ulnar artery would not seem to have been much compressed, save by the tension of the skin.

On the radial side, however, the condition was much further advanced. The skin was of a dead, waxy whiteness, with a few small brown spots. The derm and subcutaneous tissue formed a very dense, pure glistening fibrous layer of great toughness and hardness. In addition to this the connective tissue surrounding the subjacent vessel, nerve, and tendons was so thickened as to imbed them in a dense fibrous mass. The move-

The *gall-bladder* contained a small amount of bile without any calculi.

Spleen scarcely enlarged, but its capsule uniformly thickened to a slight degree with a few patches of very marked thickening. Its tissue was unusually firm and resisting, and on section the surface was closely studded with thin white fibrous trabeculæ. The pulp appeared normal, and on microscopic examination presented the usual elements, with a marked increase in the bands of fibrous tissue traversing it. The walls of the minute arterioles in its substance also seemed thickened, so that the vessels were unusually patulous and distinct; this, however, is not to be regarded as a positive observation.

Supra-renal capsules were of normal size and external appearance. On section, the central cavity usually found after middle life, was quite large, especially on right side, and contained a layer of ochre-yellow substance on its walls which proved to be purely fatty.

Kidneys were of about normal size, but unusually heavy, dense, and hard. The capsule was rather too adherent; the surface of the organs was not granular. On section, marked congestion was found, especially of straight vessels. The cortex not diminished, but very hard, coarse-grained, and of a mottled yellowish-red color.

On microscopic examination, the epithelium was found in parts highly granular. The Malpighian bodies seemed quite large and clear. The intertubular connective tissue was unquestionably increased in a quite marked degree. No cysts were found.

Blood: As already said, the blood in the right cavities of the heart was frothy from decomposition; it was, however, fluid and dark throughout the body, and but a very few small, soft, dark clots were obtained from some of the larger veins. No coagulation occurred even after twenty-four hours standing. On microscopic examination no attempt at formation of rouleaux was observed. The red corpuscles lay singly over the field, and had lost much of their hæmatin to the surrounding serum which was deeply tinged. Many of them were crenated, others very small but smooth and round, while still others were much swollen and had lost their biconcave form.

The white corpuscles were not increased in number, but in several instances at least seemed distended from osmosis. Their nuclei appeared normal.

As before stated the lining membrane of the heart and larger arteries and veins was deeply stained by the altered and exuded hæmatin. No careful examination of the veins was made, but it is believed that no marked lesion was present.

Skin and subcutaneous tissue: The appearances after death were identical with those described during life. There was the same peculiar hide-bound appearance with marked prominence of bony points. The brownish patches remained as marked as ever.

On the neck the skin was moderately thickened and indurated, but no preternatural adhesions were seen to account for the marked tightness which was noticed in this part during life.

The skin over the sternum presented a marked waxy appearance, was immovable, and on making efforts to cut it had all the toughness and hardness of sole leather. There was scarcely any subcutaneous fat visible, and the adhesions of the skin to the sternum and clavicle were

be doubted that this exposure to extreme cold, acting locally, was the cause of the onset, at least, of the sclerotic process.

The case of M. M. bears a striking resemblance in some respects to Reynaud's disease, although its later course showed no analogy to it.

BONE AND JOINT DISEASE, A SEQUEL OF CERTAIN SPECIFIC FEVERS, ESPECIALLY SMALLPOX.

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It has long been known that periostitis is an occasional sequel of enteric fever. Attention has been drawn to this fact by several writers. Murchison¹ has recorded cases in which the femur, tibia, and temporal bone were affected—the last two becoming necrosed. In 1876 Sir James Paget² published some observations in which he pointed out that these sequels appear when the patient is *well of his fever* and in a condition of advanced convalescence. The tibia appeared to be the favorite seat of election. In several cases the ribs were affected. Occasionally the femur, fibula, ulna, radius, scapula, or parietal bones had been involved. Sir James Paget had not, however, met with periostitis and necrosis after any other than typhoid fever. Of three cases recorded by Affleck,³ the humerus was involved in two and the tibia in one. And in each instance the periostitis occurred *during the course of the fever*. Keen,⁴ who collected sixty-nine cases in which continued fevers were complicated by bone disease, regards osseous lesions as infrequent although important consequences of typhoid fever. Hayward⁵ met with several cases. In one suppuration did not occur; in a second, several long bones were attacked and suppuration followed; in a third, first the left tibia was affected and subsequently the right tibia in two places. Jackson⁶ has published a case in which periostitis of the left third rib commenced two months after subsidence of the fever, and after suppurating did not finally heal for seven months. According to Bourgeois⁷ the tibia, femur, humerus, ulna, and maxilla are attacked in that order of frequency,

¹ Continued Fevers of Great Britain, 1873, p. 582.

² St. Barth. Hosp. Rep., xii. "On Some of the Sequels of Typhoid Fever: Phlebitis, Periostitis With or Without Necrosis, especially Periostitis of Ribs," etc.

³ Quoted by Macnamara: Diseases of Bones and Joints, 1887, p. 79.

⁴ Surgical Complications, etc., of Continued Fevers, Phila., 1887. Quoted by Jones: Diseases of the Bones, 1887, p. 41.

⁵ British Medical Journal, vol. i., 1885, p. 16.

⁶ Ibid., vol. i., 1885, p. 428.

⁷ Sajous, vol. ii., 1888, p. 267.

ments of the flexor longus pollicis were thus much impaired and the radial artery greatly compressed, as before described. In the central part of the carpus the tendons were more free, although their sheaths were thickened and there was some adipose tissue beneath them.

In both the cases above narrated there is especially to be noted, aside from other points of interest, the intense and apparently causeless irritability of the stomach. In the case of the female the administration of arsenic could not possibly have been held accountable for her vomiting and epigastric distress, which was out of proportion to the amount of the drug ingested and persisted long after all traces of the arsenic must have been eliminated from the system. In the case of M. M. the arsenic could in no way be suspected of exciting the gastric symptoms. On the other hand, arsenic in the latter case produced rapid and intense œdema, although but a small quantity of the drug had been administered. This peculiar susceptibility to the action of arsenic in both of these cases is noteworthy, although in the case of B. H. it merely served to light up an irritable condition in a formerly fairly quiescent organ.

In the case of B. H. the effect of coming storms upon the severity of her symptoms deserves attention. There was nothing in her history to denote a rheumatic origin of her trouble, so that to this influence cannot be attributed with certainty any causative influence in the absence of other substantiating symptoms.

The occurrence of herpes zoster in the case of M. M. can only be explained by alterations in the intercostal nerves of much the same character as was actually found to be present in other spinal nerves examined after death. It is unfortunate that the nervous supply of the affected area was not examined microscopically. The *post-mortem* appearances in both cases have a general resemblance, chiefly as regards the condition of the skin and subcutaneous tissue, but also very noticeably in regard to the marked thickening of the splenic capsule. This, in all probability, was merely a part of the apparently universal tendency to connective-tissue overgrowth so markedly seen in other situations.

Probably the tubercular process found to be present in Case I. was simply grafted upon the affection of the fibrous tissue. The patient's general condition was so much impaired by prolonged digestive disturbance and inability to lead an active life that it is easy to imagine her a ready subject for the onset of tubercular processes, without necessarily attempting to assign any special etiological significance to either disease. In her case it is difficult to trace her trouble to any cause, but in Case II. there was the definite and distinct history of exposure where the parts first involved were put into the poorest condition for receiving a proper supply of blood during an intensely cold night. It can scarcely

occurred, all the epiphyses becoming detached. In another patient abscesses formed in both legs, resulting in "stiffly flexed" knee-joints; and portions of necrosed bone were removed from the left fibula and right radius. In a fourth case necrosis of the right tibia, both fibulæ, and the left humerus occurred, and resection of the left elbow-joint was performed. Three cases have also been reported by Joubert.¹ One was a girl aged fifteen; both elbows were ankylosed in the straight position, and showed traces of former sinuses. There was also necrosis of both radii, from which long sequestra were removed. The right elbow was excised with good success. Then, in a boy aged ten years the left shoulder and both elbows were ankylosed in a nearly straight position. There were traces of former sinuses. Both elbows were excised with good results. The third case was a girl aged fourteen years, whose right elbow was ankylosed at an obtuse angle. This was also treated by resection. In a discussion on these cases, Ahmed² stated that he had frequently met with abscesses and ankyloses of joints following smallpox, and that elbow-joints were most liable to disease. Four other cases were published by Arthur Neve:³ (1) Disease of both elbows and one wrist-joint; simultaneous excisions; cure. (2) Complete necrosis of ulna; resection; cure. (3) Necrosis of left scapula; resection; cure. (4) Acute suppuration of shoulder-joint; incision and drainage; cure. Finally, two cases have been reported by Mitra⁴ in which the elbow and the hip respectively were affected and were treated successfully by incision and drainage.

I have been unable to find records of any other cases, although I do not doubt that in all epidemics of variola there must be a tendency for these sequelæ to occur.

In Kashmir, which is an unvaccinated State, with but few exceptions every inhabitant suffers from smallpox, usually in childhood. The infantile mortality is appalling. Of the survivors a large number suffer sequelæ, amongst which bone and joint diseases occupy a place of some importance.

I have now to add, to those cited above, twenty new cases, most of which occurred during the winter 1889-90, when there was an epidemic of unusual severity. All were either under my own care or that of Mr. Arthur Neve.

For the sake of brevity only the salient features will be noted.

CASE I. *Alveolar necrosis*.—Child, aged four years. November, 1889. Sequestrum measures one and a quarter inches by one and a quarter inches, and contains two empty sockets and one unshed incisor tooth.

¹ Indian Medical Gazette, vol. xviii. p. 230. ² Ibid.

³ Lancet, vol. ii., 1887, p. 609.

⁴ Indian Medical Gazette, March, 1890.

sometimes more than one bone being affected and the left side being more often attacked than the right.¹

I have only seen one case. In this, a lad of fifteen, periostitis of the tibia occurred during the height of the fever.

Scarlatina, measles, and even chickenpox² are occasionally followed by bone or joint disease. In many cases, no doubt, they act as a predisposing cause by producing great deterioration of the general health. In others there seems good reason for supposing that the exanthematous poison may have a direct and local action. In the jaw, for instance, there is a form of alveolar necrosis accompanied by shedding of teeth which appears to be the result of the local application of a specific (fever) poison to the vascular parts of the teeth.³ Scarlatina is a potent cause; but both measles and typhoid may present similar sequelæ. Cases have been recorded by Jackson,⁴ Hillier,⁵ Smith,⁶ Poland,⁷ Franklin, and Lawton.⁸ But a larger number occur which do not find their way into print.

VARIOLA.—The literature with regard to smallpox is still more scanty. I believe that it is not generally known that after variola, too, there is a liability to bone and joint affections. Fox,⁹ in 1806, recorded two cases in which alveolar necrosis occurred after variola. Ancell¹⁰ reported a case of epiphysitis in an infant eleven months old suffering with variola. In 1873 Golgi¹¹ showed that the medulla of bone is always altered in smallpox, being unusually soft and often congested. Especially is this the case in the hæmorrhagic form in which the condition of the medulla, with extravasations in its spaces, is absolutely diagnostic. McLeod¹² has described four cases of joint disease. In one, a girl aged nine years suffered two months after an attack of smallpox from symmetrical abscesses about the shoulders and elbows. Both elbow-joints were ankylosed, and a portion of the right acromion process was necrosed. In a second case, suppurative epiphysitis of the bones in both elbow-joints

¹ For further references see: Mollière (Sajous), *La Semaine Méd.*, 1887; Martha (Sajous), *E.* 24, vol. iii., 1889). Mercier, *Revue mensuelle de Méd. et Chir.*, No. 2, 1879, p. 21. Levesque, "De la Périostite dans la Convalescence de la Fièvre Typhoïde," Thèse de Paris, 1879. Routier (quoted by Hayward), *Le Progrès Medical*, 1879.

² Townsend: "Acute Arthritis of Infants.," *Internat. Journal Medical Sciences*, vol. v. Holmes: *Surgical Treatment of Children's Diseases*, London, 1869.

³ S. J. A. Salter: *Holmes's System of Surgery*, vol. iv. p. 384, 2d ed. Guy's Hospital Reports, 3d series, vol. iv.

⁴ *Medical Times and Gazette*, vol. ii., 1862, p. 681.

⁵ *Lancet*, vol. ii., 1862, p. 247.

⁶ *Ibid.*, vol. ii., 1878, p. 806.

⁷ *Medical Times and Gazette*, vol. i., 1869, p. 383.

⁸ *Lancet*, vol. i., 1879, pp. 553-685.

⁹ *Treatment of Diseases of the Teeth*, London, 1806, p. 112.

¹⁰ *Archives of Medicine*, 1830, vol. iv. p. 491 (quoted by Townsend, loc. cit.).

¹¹ Jaccoud: *Pathologie Interne*, 5th ed., vol. ii. p. 705.

¹² *Indian Medical Gazette*, vol. xv. p. 94, vol. xvii. p. 114.

CASE XII. *Both elbows*.—A female infant. February, 1890. On the left side suppurative arthritis with a sinus. The head of the radius was diseased and a small sequestrum removed. On the right side the articular surface of the ulna was ulcerated. The joints were scraped and the diseased bone gouged. Recovery took place with fair movement.

CASE XIII. *Both elbows and multiple abscesses*.—Sandhu, male, aged one and a half years. December 20, 1889. Both elbows greatly enlarged and the swelling extends up to the arms above the joints for two or three inches under the triceps. Skin unbroken. On incising under Listerian precautions, the pus was found to be thick. Synovial membrane not greatly thickened but injected, soft, and granulating. On both sides there was ulceration of the articular surface of the humerus and of the ulna. The joint cavity was thoroughly scraped with Volkmann's spoon. After a few days the use of the spray was discontinued. About December 27th an abscess appeared over the external epiphysis of the clavicle. This was incised and healed at once. About the same time a collection of pus was discovered in each leg, on the right side at the upper end of the shaft of the tibia and on the left side at the lower third. These also were opened and healed promptly. A similar localized suppuration occurred over the acromial epiphysis on the left side. This also subsided after incision without necrosis.

January 18, 1890. Left arm healed, movement free. A suppurating sinus leads into the right elbow-joint.

30th. Abscess has formed on right side of neck, not connected with bone and not glandular. A small sequestrum removed from the right elbow-joint. This was a portion of the head of the ulna. The wound then healed.

February 26. The left elbow has again begun to discharge. An arthrectomy was now performed, and a loose cartilaginous sequestrum was removed from the external condyle. There was ulceration of the articular cartilage of the ulna, the tip of which at the epiphyseal line was carious. This was followed by rapid recovery.

CASE XIV. *Elbow and necrosis of ulna*.—Female infant. January, 1890.—Anterior and outer articular surface of olecranon bare, and carious joint very little swollen. Sequestrum one and a half inches long from middle third of ulna. Joint cavity scraped. Speedy recovery.

CASE XV. *Disease of right elbow and left ulna*.—Rami, female, aged one year. February 11, 1890.—Had smallpox a month ago. Discharging sinus from right elbow. On opening the joint, articular surfaces of ulna and humerus deeply eroded. Cartilaginous tip of olecranon separated from the shaft. The cartilaginous surfaces of the bones were excised and the synovial membrane erased. The head of the left ulna was projecting under the skin near a sinus in the upper third of the forearm. The whole bone (except the styloid end) was withdrawn as a long sequestrum. The elbow-joint was unaffected, being separated from the necrosed shaft by the cartilaginous epiphyseal tissue of the olecranon. The dead bone showed no signs of osteitis or other morbid change, except partial disintegration just below the lesser sigmoid cavity. Its death had evidently been rapid and complete.

Rami was dismissed on March 14, 1890. The left ulna was being rapidly re-formed. The child was weakly, but it was hoped that she would pick up strength. There was free movement of the left elbow, and fair on the right side.

CASE II. *Alveolar necrosis*.—Nabira, male, aged five years. June, 1890. Sequestrum one and a half inches by three-quarters of an inch, containing two molar teeth.

CASE III. *Necrosis of right clavicle*.—Male, aged four years. December, 1887. Sinus over junction of osseous shaft with cartilage of epiphysis. A necrosed portion one inch long removed from junction of shaft with epiphysis. New bone around. Rapid recovery.

CASE IV. *Necrosis of clavicle*.—Ashi, female, aged six years. April, 1885. Separation and necrosis of sternal end at epiphyseal line. Small fragment removed. (Left femur and fourth rib on the right side also affected.)

CASE V. *Necrosis of spine of left scapula*.—Jamad Shah, male, aged nine months. January, 1890. Abscess at back of shoulder containing half an ounce of pus. Sequestrum at junction with acromial epiphysis, size of haricot bean with a thin prolongation for an inch along the scapular spine. Healed rapidly.

CASE VI. *Necrosis of spine of left scapula and disease of left elbow-joint*.—Azizi, female, aged seven months. February, 1890. Smallpox a month ago. A smooth surface of separation from the epiphysis at the acromial end of the spine. Sequestrum the size of an almond, with a long, sharp tail corresponding to the free edge of the spine. Left elbow has also been affected but is now almost healed. Joint fairly movable. A small sinus leads into it.

CASE VII. *Elbow and scapula*.—Fazli, female, aged three years. February, 1890. Right elbow-joint swollen and fluctuating. Articular ends of humerus and ulna enlarged and tender. On opening joint the trochlear surface of humerus found to be diseased. Ulceration of cartilage. Floor of carious bone. No sequestrum or ulceration of head of ulna. Arthrectomy. Recovery with movable joint. Sinus over spine of left scapula near acromion process, no sequestrum.

CASE VIII. *Elbow*.—Male, aged one year. October, 1889. Articular surfaces of right humerus and ulna ulcerated. Extensive necrosis of cartilage has occurred. Synovial membrane greatly thickened. Sinuses. Partial resection. Recovery in three weeks with movable joint.

CASE IX. *Elbow*.—Habiba, male, aged one and a half years. November, 1889. Sinus leading into joint. Articular surfaces of left humerus and ulnar found ulcerated. No sequestrum. Carious end of ulna snipped off with bone forceps leaving cartilaginous olecranon process. Rest of joint including thickened synovial membrane removed by scraping and gouging. Delayed but satisfactory recovery with limited mobility of joint.

CASE X. *Elbow*.—Ahadou, male, aged two years. December, 1889. About a month since smallpox. Abscess of left elbow-joint with sinus at radial side posteriorly. Synovial membrane thickened and granulating. Outer aspect of articular surface of humerus and external condyle eroded with bare carious bone forming the floor of the ulcer. No sequestrum. Gouged and scraped. Rapid recovery.

CASE XI. *Elbow*.—Douliti, female, aged one year. December, 1889. Swelling of left elbow. Fluctuation. No sinus. Skin unbroken. Joint opened by posterior incision and bare bone on trochlear surface of humerus gouged. Ulcerated articular cartilage of ulna scraped. Small sequestrum from ulna, size of haricot bean. Synovial membrane erased. Rapid recovery.

articular ends, the blood-forming properties of the marrow, and in the case of the teeth and alveolar processes, the dermal origin and extraordinarily active developmental changes, all tend to mark out the joints and bones for participation in the morbid processes set up by specific fever poison.

In most of the continued fevers, abscesses of soft tissues may occur as sequelæ. In typhoid we know that there is, in addition to more obvious changes, a scattered minute lesion to be found oftentimes in the mesenteric glands, spleen, and liver. This, which is of the nature of a localized cloudy swelling, is probably infective, although I believe that hitherto the typhoid microorganism has not been demonstrated in it. In most cases resolution occurs. But it is not difficult to see how predisposition of the patient and intensity of the poison might favor suppuration. Now, in enteric fever, which is a disease *totius substantiæ*, it is probable that the abscesses which form (whether periosteal or not) have an origin of this nature.

But while the same tendency exists in other infectious febrile diseases, nowhere is it more marked than in smallpox. In the confluent variety especially, the formation of boils and abscesses is common. And in a suppurative disease like variola it might be anticipated that symptoms of a pyæmic nature would sometimes occur. The poison is absorbed by the lymphatics and passes on into the small veins, from which it is scattered far and wide. It is by no means improbable that multiple abscesses in smallpox may thus have an embolic origin. To some of the cases recorded above this affords a ready solution. But although the mechanism of production may be similar to that of pyæmia, the poison is, I take it, distinct. The abscesses are free from putrefactive odor and run an aseptic course under strict Listerism. It is an interesting point as to whether the pus from such a joint is capable of reproducing smallpox if inoculated. For it is a post-variolous condition, and the joint affection does not coincide with the skin eruption.

What determines the sites of manifestation? Why is the upper extremity so frequently affected? For as far as epiphyseal nuclei are concerned the development of the upper extremity is much later than that of the lower, and, therefore, it might be regarded as less prone to disease. But on the other hand, I think that a young infant uses its arms more than its legs, and so the former are more liable to injury. Again, in Eastern countries where the lower half of an infant's body is warmly reposing within its mother's dress, the arms are certainly more exposed to cold. Moreover, there is often a greater development of pustules on the upper half of the body, and this might influence, through the lymphatics, the site of a suppurative lesion.

The seat of election in the bones is either at the epiphyseal line or else under the periosteum. In cases of complete necrosis, as, for instance,

CASE XVI. *Disease of left ulna and left knee-joint.*—Kougi, female, aged two years. February 3, 1890.—A sequestrum of the ulna exactly similar in every respect to Case XV. Healing was equally rapid. In the knee-joint both the femur and tibia were profoundly diseased. Beneath the external condyloid cartilage at the epiphyseal line there was an area of softened diseased bone the size of an almond. From this a sinus passed through the ulcerated cartilage to the joint. In the head of the tibia was an abscess cavity containing the epiphyseal nucleus as a loose sequestrum. This cavity communicated above with the joint, and anteriorly there was a sinus communicating with the open air. Thus there was suppurative arthritis with double epiphyseal abscesses, the tibia being the more severely affected. Arthrectomy was performed and gouging. When the child left (March 14, 1890) there was still some discharge from the sinus. One knee had consolidated much, but the limb was distinctly flail-like.

CASE XVII. *Necrosis of Ulna.*—Zuni, female, aged ten months. June, 1890.—Had smallpox three months ago. Now a deep scar two inches long immediately below olecranon, and at middle third of left ulnar border of forearm a sinus communicating with dead bone. From this I withdrew a cylindrical sequestrum two inches long, evidently the remains of a completely necrosed ulna. The wound healed in a few days.

CASE XVIII. *Disease of the knee-joint.*—Ramzana, male, aged two years. March 31, 1890.—Had smallpox two months ago. Knee swollen and evident synovial thickening, with enlargement of articular ends of femur and tibia. Pus thick. Head of tibia deeply eroded and necrosis of the epiphyseal nucleus. This was removed and the synovial membrane erased. The patient was discharged on May 12, 1890, quite well. The knee was not stiff.

CASE XIX. *Sub-periosteal abscess of femur.*—A boy, aged three years. February, 1890.—Knee painful for twenty days. Deep, indistinct fluctuation behind and above knee. On incising to the bone above the condyle on the outer side, a small collection of sero-purulent fluid was tapped. The child recovered without necrosis.

CASE XX. *Necrosis of humerus (epiphyseal).*—Lassoo, male, aged seven years. May 31, 1890. Had smallpox one and a half months ago. Great oedema of upper extremity. Two sinuses, one at the upper the other at the lower end of the humerus, each leading to dead bone. Sequestra were removed from each of these positions. The upper was about two inches long, and evidently connected with the epiphysis. The head of the humerus appeared absorbed. The lower sequestrum was apparently also juxta-epiphysary. The shaft of the bone was much thickened, and there was some stiffness of the elbow-joint. The discharge rapidly subsided. The boy was dismissed June 28th. It is possible that a further sequestrum may separate from the shaft of the bone at some future time.

ETIOLOGY.—It is not surprising that organs occupying such a large area, and discharging functions so important as the bones and joints, should occasionally suffer after certain specific fevers. The intimate nervous and vascular relationship of the joints to the skin by which they are covered, the affinities of endothelium and epithelium, the important vascular supply of bones, especially of the medulla and

affected. When sinuses exist they are usually found close to the upper end of the olecranon process on the outer or inner side.

It appears probable that there are here two types of elbow disease. One is a *primary arthritis*—the joint becoming affected as a whole. For in several of the above cases the different structures of the articulation appear to be involved in a common disease. In fact, it may be said that where the epiphyses are not obviously affected we have probably to deal with a general arthritis. And even sometimes when the epiphyses are detached late in the course of the disease it is only a part of the general process of disintegration. Where *primary epiphysitis* has occurred the disease can be localized to the epiphyseal line or else is found to be more severe at that position.

2. *Epiphyseal disease.* If arthritis of the elbow is the typical joint sequela of smallpox, there are some forms of epiphysitis which are hardly less characteristic. Such, for example, are the instances of disease of the acromial and clavicular epiphyseal lines in which the focalization of the lesion is most precise. But in the long bones also the same tendency is observed. Thus, in one case both ends of the humerus were attacked. In the examples of entire necrosis of the ulna it will be observed that in four cases the elbow-joint was unaffected, although separation had taken place at the epiphyseal line above the olecranon process of the shaft.

In the knee-joint, however, the tendency for an epiphysitis to involve the articular cavity is great. I have noticed this before in other cases than smallpox. But it is well illustrated by cases XVI. and XVIII.

3. *Bone disease.* Apart from caries and small sequestra occurring in the diseased joints, bone disease occurs chiefly in three forms after variola, viz.: Complete necrosis, partial necrosis, and subperiosteal abscess. There were four cases of *complete necrosis* of the ulna. In all of these the bone was unchanged, except in so far as disintegration had set in. There was no evidence of osteitis.

The death must be regarded as due to subperiosteal suppuration. In such cases it appears that separation at the epiphysis may have been either primary or secondary. If the former, the periosteal suppuration may have arisen at the epiphysis. If the latter, then the suppurative periostitis was the primary disease, the epiphysis becoming involved subsequently. We can understand that in such a case as that of Sandhu (XIII.) the subperiosteal abscesses might in the absence of treatment have produced death of the tibial shaft. In one case there was almost complete necrosis of both radii. *Partial necrosis* occurred twice in the left fibula and once in the right fibula, right tibia, and right radius, left ulna, left humerus, and left scapula. *Subperiosteal abscess* without necrosis occurred twice in the femur, twice in the tibia, and also on the fourth rib.

those of the ulna, both sides may be attacked, and it is difficult to ascertain which is the primary lesion.

The selection of these points for attack is due partly to their developmental activity and consequent vascularity. In the case of the epiphyses the junction of the rigid shaft with the more yielding cartilage offers a condition favorable to mechanical strain and injury. Any other predisposing cause (whether hereditary, as syphilis, or not), would have due weight,¹ in favoring bone disease.

Pathology.—The thirty-six cases of bone and joint disease after variola cited above can be grouped into divisions. Thus, there were four cases of alveolar necrosis. Twenty-one patients suffered from bone disease with necrosis. Twenty-six suffered from joint disease. In twelve cases one or more epiphyses were affected.

Disease was more frequent in the upper extremity. Eighteen patients suffered from disease of the elbow-joint. In several of these the lesion was bilateral, so that there were twenty-five elbow-joints affected. In six instances there was disease of the acromion. The other figures stand as follows: Necrosis of ulna five, clavicle three, radius three, humerus two, disease of shoulder-joint two, wrist one. This gives a total of twenty-eight joint lesions in the upper extremity and fourteen bone affections. While in the lower extremity only five joints were diseased and nine bones, viz.: knee-joint four, hip-joint one, tibia four, fibula three, femur two.

Alveolar necrosis is probably less common after smallpox than after some other eruptive fevers. The affections peculiar to variola may be considered conveniently under the headings: (1) Joint disease, (2) epiphyseal disease, (3) bone disease.

1. *Joint disease.* I have already shown how frequently the elbow is affected. In seven cases the disease was bilateral. In the rest it appeared to occur with about equal frequency on the right and left sides. The condition is essentially subacute. The articular ends of both humerus and ulna are apt to become enlarged. The muscles are not distinctly wasted. In several cases the ligaments are much relaxed. The synovial membrane is thickened and presents a velvety appearance. Ulceration of the articular cartilages is invariably present. The ulna and humerus appear to be affected with equal frequency. In the former the upper bony tip of the olecranon end of the shaft often forms the floor of the ulcer, and there is a distinct tendency to the casting-off of a small scaly sequestrum. In the humerus the trochlear surface is usually eroded. In several cases this has proceeded so far as to destroy all form and to leave the lower end of the bone as a convex, ulcerated surface with patches of carious bone in the floor. In other cases there is detachment of one or more epiphyses. It is rare for the radius to be

¹ "Etiology of Bone Disease," by E. J. Neve. Indian Medical Journal, 1888-89.

infants and young children, and are often multiple. They are subacute and a fatal termination is rare.

f. The various conditions enumerated above have a tendency to spontaneous recovery by suppuration, extrusion of sequestra, and ankylosis of joints.

g. As treatment, incision and drainage, with removal of sequestra, is usually sufficient. But in cases of arthritis, prolonged suppuration and ankylosis may be avoided by arthrectomy or partial resection of the joint.

MISSION HOSPITAL, KASHMIR, INDIA.

July 4, 1890.

SURGICAL AND MECHANICAL TREATMENT OF THE DEFORMITIES FOLLOWING INFANTILE SPINAL PARALYSIS.¹

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The pathology of infantile spinal paralysis, or anterior polio-myelitis, is not considered in this article, since the object of the paper is to deal only with the severer grades of resultant deformities.

These deformities are produced by muscular atrophy, degeneration, and contracture, together with want of bone-growth, and the distortions which result from locomotion. The deformities are frequently so great that the individual spends his life upon the floor and the members become so misshapen that they are mechanically unsuited for locomotion even could muscular power be restored. This paper is intended to deal almost exclusively with this class of cases—the ones ordinarily considered hopeless cripples.

Locomotion, however, even in these cases, is often possible by the proper application of surgical means together with the skilful use of mechanical appliances, thereby greatly augmenting the usefulness, the health and the happiness of the individual.

The limbs must first be brought into such position that they will assist in sustaining the weight of the body, or be incorporated as a part of the apparatus to sustain such weight, either with or without crutches.

Surgical measures offer the most rapid and efficient hopes for relief. To attempt to rectify these members by mechanical means alone is to inflict an unwarrantable amount of pain, time, and expense without accomplishing any better results than can be secured by vigorous

¹ Abstract of a paper read at the Tenth International Congress, Berlin, 1890.

DIAGNOSIS.—The history and period of onset of these diseases is characteristic. A bone or joint lesion occurring in an infant or young child three or four weeks after smallpox and running a subacute course with suppuration, leaves little doubt as to its nature. The patients are usually profoundly pock-marked with recent scars. Cases seen for the first time as late as two or three months after smallpox show from the advanced state of their lesions that the condition must have arisen soon after, if not during, convalescence.

TREATMENT.—In many cases the treatment required is extremely simple. Incision and drainage of subperiosteal collections is sufficient. Sequestra become separated with great rapidity (in spite of the otherwise subacute course of these diseases) and can be readily removed. In the joints simple incision and drainage are sometimes productive of good results, but they are more frequently followed by prolonged suppuration and final ankylosis. So the choice really lies between modified excision and arthrectomy. I think that the joint should be freely laid open and the synovial membrane removed as far as possible. The amount of articular cartilage removed must depend upon the extent of the disease. But generally the surgeon should aim at removing sufficient to diminish the risks of ankylosis and yet avoid interference with epiphyseal growth.

Owing to the age of the patients recovery is usually rapid. Indeed, even if left untreated, there is a strong tendency to natural cure, whether by spontaneous extrusion of sequestra or by suppuration and ankylosis of joints.

SUMMARY.—*a.* Periostitis, epiphysitis, necrosis, and arthritis may occur after and on account of exanthematous fevers, especially smallpox.

b. They usually, but not invariably, appear during late convalescence.

c. In *typhoid* fever the most frequent of these sequels is periostitis. And this attacks long bones by preference, especially the tibia, but seldom results in necrosis. Arthritis, if it ever occurs, must be extremely rare.

d. Alveolar necrosis is of not infrequent occurrence. It is a commoner sequel of scarlatina and measles than of the other exanthemata.

e. After smallpox—

(1) Arthritis, the most characteristic lesion, occurs with greatest frequency in the elbow, and less often in the knee, shoulder, hip, and wrist. Sometimes it is primary. Occasionally it is secondary to epiphysitis.

(2) Next in frequency is partial or entire necrosis of long bones, especially the ulna.

(3) Suppurative epiphysitis with or without necrosis is not uncommon. The acromion is frequently attacked, as are also the long bones.

(4) These post-variolous diseases occur chiefly, if not entirely, in

preferable plan, since it heals more rapidly and does not leave a resultant deep sulcus.

When the deformity of the foot is in the direction of valgus, section of the peroneals and forcible rectification of the foot with fixation for a number of weeks in a condition of artificial varus will prove valuable if followed by the use of the proper apparatus.

In calcaneus, shortening of the tendo Achillis is sometimes desirable.

Force to an extreme degree may be required in old cases, and if employed by the surgeon's hands over sand-bags and hard pads need never result in sloughing. Torn ligaments, or even fractures of the bones, if subcutaneously performed, will rapidly heal. Excision of one or more bones will sometimes be required in adult cases.

V. Resection is sometimes desirable at the knee when there is great bone-distortion and the operative procedures already enumerated have been insufficient. Resection is also sometimes desirable in flail limbs in order to secure a stiff walking member; also sometimes in back-knee, in-knee, and out-knee.

At the ankle and foot, tarsectomy is also occasionally necessary in extreme cases. Removal of the astragalus is the simplest and most effective measure. The other bones may sometimes require excision. Powerfully and intelligently applied force with the divisions already described usually takes the place of any form of excision of the tarsus.

VI. and VII. Osteotomy and amputation are procedures which will occasionally become necessary.

Mechanical treatment after operation.—A good position can often be secured by horizontal extension with weight and pulley; by the application of splints or plaster-of-Paris dressings, or by other methods of rectification while the patient remains in bed.

For locomotion some mechanical appliance usually becomes necessary. The principles of these appliances only can here be described. All apparatus should be as light as possible; it should be so arranged that the circulation is free and unmolested, and muscular action should be favored rather than hindered. Every muscle should be compelled to do its full work in the support of the body, since by walking, running, playing, etc. (the most valuable of gymnastic exercises) will the muscle cells be developed. Elastic force should be freely employed, since by such assistance the peroneals, the tibials, the quadriceps, the extensor femoris, or any other muscle, can have its force augmented and yet be itself brought into active use. Pads, straps, stop-joints, rarely locked-joints, etc., are all to be applied as needed.

A flattened valgic arch of the foot should be supported by accurately-fitting steel springs and by elevating the sole of the shoe upon the inner side. The in-knee and out-knee, etc., should be properly supported by pads. An apparatus may be only necessary for the ankle, or the appli-

measures. Section of the tendons and muscles will necessarily be performed upon the strongest group, and they are thus placed at a slight disadvantage, thus tending to restore the equilibrium of the muscular action of the limb.

Surgical treatment may be classed under the following heads :

- I. Tenotomy.
- II. Myotomy.
- III. Division of the contracted fasciæ and other tissues.
- IV. Force.
- V. Resection.
- VI. Osteotomy.
- VII. Amputation.

I.-IV. The first four procedures are frequently combined as one operation. The best rule to be followed is that the shortened tissues must be relieved by section and by force sufficient in amount to permit rectification of the member or to place the limb in a position for locomotion.

At the hip, the deformity being in the direction of flexion, myotomy of the origin of the tensor vaginæ femoris, the sartorius and long head of the rectus, together with the fascia, is frequently necessitated. Rarely the psoas iliacus or the external or internal rotators or the adductors will require division. In this latter case open division is the only safe method. The femoral artery and anterior crural nerve must be carefully avoided. Otherwise section can be freely performed, but whether done subcutaneously or by open incision, thorough antiseptic precautions must be rigidly enforced. Force must be employed to the extent consistent with the integrity of the bone. Extension by weight and pulley must subsequently be applied for many weeks. This continued extension will also greatly benefit the frequently accompanying condition of lordosis.

At the knee, section of the tendons of the biceps or of the semi-membranosus and semi-tendinosus is frequently necessary. If dense bands of contracted fascia remain in the region of the popliteal space open incision will be the wiser procedure.

Horizontal extension by weight and pulley and constant pressure upon the knee by means of splints or weights will add to the subsequent benefits to be obtained by operation.

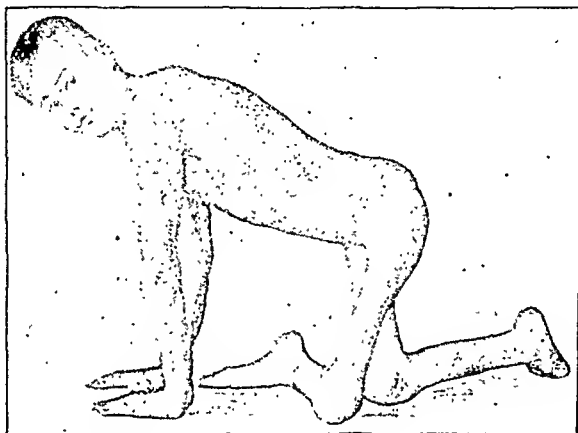
When great deformity of the condyles is present, as is so frequently the case, resection offers the best hope of restoration. The condition of hyper-extension or of genu-recurvatum or back-knee does not permit of surgical relief except by resection.

Section at the ankle and foot will vary according to the condition of the deformity. In extreme equino-varus, division of the tibialis anticus, posticus, fasciæ and ligaments is frequently required in addition to the tendo Achillis; in fact every contracted tissue which resists rectification must be divided either openly or subcutaneously. The former is the

canes. After one year walked without either, even on rough pavements. Legs developing.

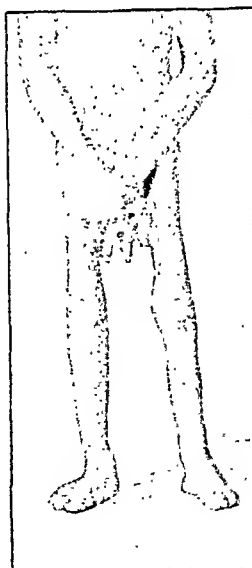
CASE II.—Boy, aged fourteen; infantile paralysis in infancy. At eleven years of age had never walked; dragged himself along the floor.

FIG. 4.



Legs greatly twisted. Flexion at right-angles at the hips and knees. Equino-varus left foot; equino-valgus right foot. Hopeless cripple.

FIG. 5.



Subcutaneous section at the hips, knees, and feet. Fixation by plaster-of-Paris and extension. In two months he walked with crutches with the assistance of an apparatus with elastic straps over the quadriceps femoris, peroneals, and weakened muscles. The valgic foot supported beneath the sole with an arched plate. In six months he was walking long distances, and in one year ran speedily with crutches. Three years later he uses crutches only for long walks, and a cane only for ordinary progression. His limbs are developing and he is capable of earning his own living.

CASE III.—Girl, aged ten; infantile paralysis at three years of age. Absolutely helpless. Discharged from several hospitals condemned to perpetual cripplehood. Limbs perfectly helpless and flail-like. Marked distortion. Extreme lordosis.

Operation; thorough section of all the contracted tissues at hips, knees, and feet; forcible extension and fixation and subsequent pulley extension for nine weeks.

Flexion and lordosis greatly improved. An apparatus was manufactured practically constituting the lower half of the body, thus making

ance may need to extend almost to the axillæ. In helpless cases, where the entire lower portion of the body is paralyzed, the apparatus must extend to the thorax to support the weight of the body while the body is swung forward upon crutches. In these cases locking and unlocking joints at the hips and at the knee are essential, as the support must be rigid during walking, but flexion is necessary in the sitting posture. The advantages of locomotion in the open air, even with such an extensive apparatus and on crutches, can only be appreciated by one who has been compelled to spend his life upon the floor or upon a bed.

The following are specimen cases selected from my note-books showing the gain that can be accomplished. The illustrations are all taken from photographs.

CASE I.—Female, aged twelve years; infantile paralysis in infancy. Has never walked; only slides along the floor. Totally unable to stand, even with the help of a chair. Flexion at the hips and knees. Sub-luxation of both knees. The feet are only slightly deformed, as the weight of the body has never been borne upon them.

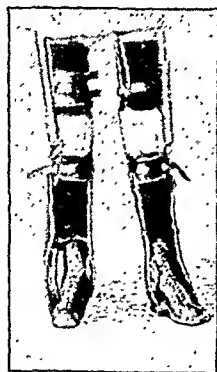
FIG. 1.



FIG. 2.



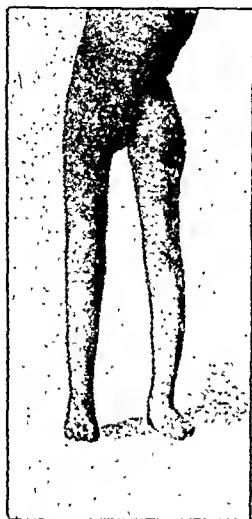
FIG. 3.



Subcutaneous section of the tensor vaginæ femoris, rectus, sartorius, and hamstring tendons, with strong subsequent force, and horizontal extension with weight and pulley. In eight weeks, apparatus extending from the perineum to the feet. Walked first with crutches, then with

institution I have operated on a number of these cases), I have been able to secure the accompanying photographs illustrative of her locomotion.

FIG. 9.



This series is one of the many admirable advances made by Mr. Edward Maybridge in photographing animals when in motion. By a series of electrical appliances attached to a number of cameras the various stages of progression are secured throughout the action of the limb from the time it is placed upon the floor, through each of the successive acts of raising, carrying forward, and lowering, until the floor is again reached. The advance of locomotion is depicted from left to right.

Operation as before, and apparatus applied. Distortion of pelvis and hip irremediable. The limbs are still unable to maintain the weight of the body, but with a little support from the hands she can stand alone. She progresses very comfortably with a cane or with crutches and apparatus.

CASE V.—Girl, aged thirteen; infantile spinal paralysis from infancy. Very helpless. Deformities and operation as before.

Apparatus applied. At first used crutches, afterward cane. With apparatus can walk with a fair degree of speed. Slow progression even without apparatus.

CASE VI.—Girl, aged thirteen. Flexion at hips and knees; not so marked as in preceding cases. Extreme valgus of right foot. Still obliged to use one crutch, as the right limb is unable to bear the weight of the body, but could do so if apparatus at hip and knee were made rigid. Without apparatus the right limb hangs almost helpless.

CASE VII.—Boy, aged ten. Similar history. Operation two years since. Now walks without cane or crutch, but usually uses cane. Cannot walk at all without apparatus.

Since writing this paper a number of cases (some of them accompanied by great distortions, even of the spinal column) have been operated on. The results have been most satisfactory.

CONCLUSIONS.—1. Even the severe resultant deformities of infantile paralysis are capable of being benefited by the skilful employment of surgical measures and mechanical appliances. No case with fairly strong upper extremities should remain in helpless cripplehood, since even crutch locomotion is far preferable to a life upon the floor or upon the bed.

2. The deformities following infantile paralysis can be largely prevented by the early use of some form of apparatus.

3. Surgical measures in long-standing cases should usually precede mechanical appliances, since pain and time are thereby saved, and the

a support to sustain the weight of the body while it was being thrown forward on crutches. The apparatus extended from the thorax to the feet and rigidly encased the body and limbs, which were a part of the apparatus. There were locking and unlocking joints at the hips and knees.

In one month after, she was able to walk a square upon crutches.

FIG. 6.

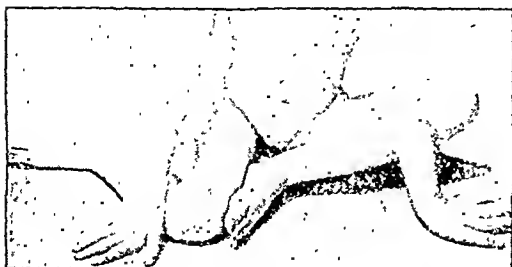
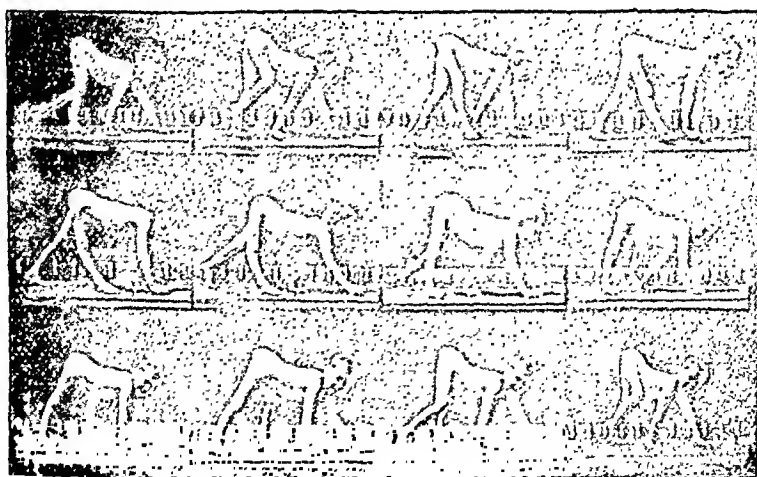


FIG. 7.



CASE IV.—Girl, aged eleven; infantile paralysis from childhood. Totally unable to support the body in an erect position, but could drag herself along the floor. She could walk in the quadrupedal position, as shown in the photograph, with an awkward, difficult gait. The right foot was in a condition of equino-varus and the left that of valgus. There was great distortion of the left hip, not only in the direction

FIG. 8.



of flexion, but also twisting of the femoral neck simulating dislocation. Through the kindness of Dr. J. Hendrie Lloyd, Attending Physician to the Home of the Merciful Saviour for Crippled Children (in which

perience in the treatment of ear diseases knows well how numerous are the cases of chronic suppurative middle-ear inflammation, where all the ordinary methods of treatment seem to avail nothing. The discharge persists or returns after a short, quiescent period in spite of our usual local remedies. These cases are generally regarded as almost hopeless, the patients being often sent away finally with the advice to content themselves with simply keeping the ear clean. Such is the fact in many cases, and such the condition which persists for the remainder of their lives.

A brief glance at the local conditions in the ears of these patients will be necessary to illustrate clearly what it is desired to especially emphasize in this paper. On looking into the ear of such a case of long-protracted purulent discharge, we find a variety of conditions, all of which may be the result of the same source of trouble. In the one, the remnants of the drum-head will be adherent to the inner wall of the tympanum, usually above, forming pouches or pockets for the retention of secretions and shutting off the real seat of disease. Such act, furthermore, as barriers to the application of our local remedies. In other instances we note the entire absence of the drumhead, and the handle of the hammer is seen projecting freely downward into the tympanic cavity, or there remains only the carious head and neck of this ossicle almost concealed from view. In still other cases the carious malleus and incus (if the latter be present) are firmly attached to the tympanic walls by adhesions in all directions, thus filling up and closing off the natural outlet for the accumulating secretions from the upper chamber or attic of the tympanum.

One frequently observes a group of cases, furthermore, where the drum-head is intact, excepting above the short process of the hammer; and here a sharply-defined perforation exists in the *membrana flaccida*. The purulent disease is here confined to the tympanic attic, and the ossicles, although to all appearances in a normal state, are generally more or less carious. Frequently also the temporal bone itself in the immediate neighborhood is likewise diseased. In some instances, a polypoid or granulation mass protrudes through such a perforation, having its starting-point in the attic or being attached to the carious ossicles. These "attic" cases are the most discouraging and difficult to handle, as they seldom yield to the ordinary methods of treatment. They have been frequently described and alluded to in the past twenty-five years by such authors as Von Troeltsch, Moos, Green, Blake, Burnett, Schwartze,¹ Kretschmann,² Kessel, Sexton, Stacke and others. According to Walb,³ the involvement of the attic of the tympanum with con-

¹ Naturforscherversammlung in Magdeburg, 1884.

² Archiv für Ohrenheilkunde, vol. xxv. p. 165.

³ Ibid., vol. xxvi. p. 202.

resulting limbs are in nowise inferior to those obtained by the slower processes of mechanical rectification.

4. The surgical measures to be employed are tenotomy, myotomy, division of the fascia, application of force and resection. Osteotomy and amputation are sometimes necessary.

5. Mechanical appliances should be used to retain the limb in proper position, but they should not interfere with the circulation of the member. Crooked limbs can often be straightened so as to be made a part of the apparatus, and the muscles of these limbs should be compelled to do their full extent of work in supporting the body. The apparatus must frequently be made to support a large portion of the weight of the body, the helpless, flail-like limbs being accessories.

6. No case should be abandoned without the most careful and repeated attempts at rectification, as even feeble locomotion will in time become greatly improved by exercise in walking, and the health and happiness of the individual will thereby be greatly increased.

1818 CHESTNUT STREET, PHILADELPHIA.

THE TREATMENT OF CHRONIC PURULENT OTITIS MEDIA BY EXCISION OF THE CARIOUS OSSICLES AND REMOVAL OF OBSTRUCTIONS IN THE TYMPANIC ATTIC,

WITH A REPORT OF THREE CASES.¹

BY CHRISTOPHER J. COLLES, M.D.,
OF NEW YORK.

In the present era of surgical advance and discovery, when operations entailing the removal of larger or smaller portions of the diseased economy are so freely and successfully undertaken, it might strike one as strange that one organ should be deprived of the gratifying results of such radical treatment. We remove without hesitation the cataract lens, resect diseased joints, snare off hypertrophied turbinate bodies, etc., and yet otologists, with but few exceptions, have been reluctant to remove from the middle ear portions of a diseased sound-transmitting mechanism, when the latter has lost, by long-continued destructive supuration, all of its normal functions. They have contented themselves, up to the present time, with palliative methods of treatment, such as the insufflations of powders, the instillations of acids, caustics, with syringing, douching and the like. Everyone who has had much ex-

¹ Read before the Hospital Graduates' Club of New York.

panum, the secretions accumulate, while their pressure on the neighboring sensitive structures causes more or less intense pain and suffering. In favorable instances they finally force their way outwardly into the external auditory canal, a procedure generally described by the patient as a "gathering and breaking" in the ear. Such persons suffer much from headaches, noises in the head and ears, vertigo, nausea and other distressing subjective symptoms, and their general health is usually a poor one.

It must be borne in mind that we are dealing now with cases which have undergone the ordinary methods of treatment for a longer or shorter period without deriving any permanent benefit from such means, and have been given up as nearly hopeless. That removal of these sources of irritation should be followed by healing of the parts affected seems a very natural and warrantable conclusion.

In those cases, however, where, owing to prolonged suppuration, the temporal bone in the immediate neighborhood of the tympanum has become affected, it cannot be expected that removal of the carious ossicles will be followed by immediate cessation of all discharge and recovery of the patient. But we know that removal of these obstructing tissues and the breaking down of the adhesions and pockets in the tympanic cavity affords free drainage and permits of better application of local remedies. The danger, furthermore, from the blocking up of the discharge during acute exacerbations consequent on colds in the head, etc., is removed.

Much more might be mentioned concerning the condition of these patients, but space will not permit us to go deeper into the subject. Enough has been said, however, for those interested, to demonstrate the conditions existing in those cases where the treatment about to be described is considered advisable and of great practical value.

Kessel,¹ Schwartz,² Kretschmann,³ Sexton,⁴ Stacke,⁵ Burnett,⁶ Wetzel,⁷ Ludwig,⁸ Urbantschitsch,⁹ and others agree practically as to the

¹ Archiv für Ohrenheilkunde, vol. xvi. p. 196. Also: Correspondenz-blätter des allgemeinen ärztlichen Vereins von Thüringen, 1887, No. 9.

² Chirurgische Krankheiten des Ohres, 1885, p. 280, et seq.

³ Archiv für Ohrenheilkunde, vol. xxiii. p. 234; also: vol. xxv. p. 165.

⁴ The Ear and its Diseases, 1888, p. 368.

⁵ Archiv für Ohrenheilkunde, vol. xxvi. p. 115; also: "Betrachtungen über den gegenwärtigen Stand der Therapie chronischer Mittelohreiterungen, u. s. w.," Berliner klinische Wochenschrift, 1889, No. 16.

⁶ Trans. American Otological Society, Sept. 18, 1888, and July 15, 1890. Also: The Medical News, November 2, 1889.

⁷ "Die Exeision des Trommelfells und der beiden äusseren Gehörknöchelchen, als Heilmittel chronischer Otorrhoe." Inaugural-dissertation, Halle, 1889.

⁸ Archiv für Ohrenheilkunde, vol. xxix. p. 241.

⁹ Lehrbuch der Ohrenheilkunde, 3te Auflage, Wien und Leipzig, 1890, p. 372.

sequent perforation of the membrana flaccida or Shrapnelli is, in a number of cases, a secondary one, the primary affection beginning with an otitis of the bony margin to which the drum-head is attached. From thence the disease extends later on to the ossicles, at first, namely, to the hammer. Kretschmann¹ considers that the cavity of the tympanum is first involved, and following this the ossicles are attacked with caries, owing to the retention and decomposition of the secretions.

In the cases just described it has been found that the ossicles, almost without exception, have become more or less carious in consequence of the long-existing purulent disease of the drum. Investigations in this direction were undertaken many years ago by both Gruber² and Von Troeltsch.³ Schwartze,⁴ in enumerating the different regions of the temporal bone as regards the relative frequency with which they become affected with caries, places the ossicles fourth in this respect.

Caries of the ossicles occurs frequently and is found in persons of all ages, says the same author,⁵ the chief causes being acute purulent processes occurring with scarlet and typhoid fevers or with chronic suppurative inflammation in scrofulous and tuberculous persons. The incus shows defects from caries most frequently, then the malleus, the latter especially about its head. Ludwig⁶ found among 32 cases of removal of the incus and malleus, the incus carious (malleus intact) in 11 cases, or 34 per cent.; both ossicles carious in 16 cases, or 50 per cent.; the incus carious, therefore, in 27 cases, or 84 per cent.

The stapes is seldom affected.⁷ When the stapes shows carious defects it is usually on the arms and head of this ossicle where such are found, the foot-plate remaining intact. The latter fact is accounted for, probably, from the reason that this ossicle acquires its nourishment partially from the bloodvessels of the labyrinth,⁸ and is thus better able to withstand the inroads of disease affecting the mucous lining of the drum cavity.

Every fresh cold acquired by such persons aggravates the ear trouble; the drainage being obstructed by the condition existing in the tym-

¹ Op. cit.

² Wiener Medicinalhalle, 1863.

³ Archiv für Ohrenheilkunde, vol. iv. p. 247.

⁴ Chirurgische Krankheiten des Ohres, 1885, p. 387, et seq. Also: "Sitzungsprotokoll der Section für Ohrenheilkunde auf d. Naturforscherversammlung in Wiesbaden, 1873," Archiv für Ohrenheilkunde, vol. viii. p. 226.

⁵ Ibid.

⁶ "Ueber Ambossaries und Ambossesextraction, ein Beitrag zur Aetiologie und Therapie der chronischen Mittelohreiterung," Archiv für Ohrenheilkunde, vol. xxix. p. 241. Also: Bericht über die Thätigkeit d. königlichen Universitäts Ohrenklinik zu Halle a. S. vom 1ten April, 1888, bis 31ten März, 1889. Same vol. p. 263.

⁷ Schwartze: Beiträge zur Pathologie u. path. Anatomie des Ohres. See also: Die chirurgischen Krankh. d. Ohres, p. 389. Also: E. Wetzel, "Excision des Trommelfells, etc." Inaugural-dissertation, Halle, 1889, p. 8.

⁸ Ibid.

The patient, a female, aged twenty-three years, had suffered with otorrhœa (right) since childhood. The discharge ceased in eight days after the operation, also the distressing tinnitus. Before the operation the voice could not be heard at all; after excision ordinary conversation could be heard at the distance of one metre.

In 1887 Kessel tells us that he has performed the operation in more than 100 cases, and with the most gratifying results.¹ Schwartze has been for many years an ardent advocate of this procedure; some 28 of his cases operated at the Ear Clinic at Halle were recently reported by E. Wetzel.² Ludewig³ has also lately published 32 cases of excision of the incus and malleus, gathered from the same sources.

Kretschmann, Stacke, Sexton, C. H. Burnett, and Colles⁴ have also reported many cases, and all demonstrate the beneficial results of this treatment.

Of 120 cases compiled from the sources mentioned and in which the details are more carefully reported, we find that in 60 per cent. the otorrhœa was cured, and in only 4½ per cent. unimproved, whilst the remaining cases resulted in more or less marked improvement in this respect. The hearing improved in 63 out of 120 cases, or 52½ per cent., in many of them to a remarkable degree. In two cases reported by Wetzel, the hearing became worse; in the one the stapes was removed by accident, whilst in the other case the mastoid antrum was opened at the same time that excision was done.

Even in those cases where the otorrhœa did not cease entirely, owing to a carious condition of the neighboring bony walls, such subjective symptoms as headaches, tinnitus aurium, vertigo, etc., are reported to have either ceased entirely or have been greatly diminished in intensity.

All authorities on the subject agree as to the danger-less character of the operation. No case of fatal results has been reported up to the present, and it is difficult to see why such should occur if ordinary precautions are exercised. In a few cases temporary facial paralysis has followed, but for a short interval only. It is probable that in these cases the canalis facialis was already greatly involved in the destructive process. Regarding the operation itself a brief description will be necessary. For the purpose of illumination an electric head-light is decidedly better than the ordinary light used in examination. The lamp (6 to 8-candle power) is attached to the head-band like a mirror. Complete immobility of the head is secured by narcosis. After the ear has been thoroughly cleansed, the remains of the drum-head are cut away with a

¹ Correspondenz-blätter des allg. Aerztlich.-vereins von Thüringen, 1887.

² Op. cit.

³ Op. cit.

⁴ "Ueber 13 Fälle von chronischer Otitis Media, behandelt durch Excision der Gehörknöchelchen; nebst Bemerkungen," Deutsch. med. Wochenschr., 1889, No. 28.

indications for excision in cases of chronic otorrhœa. "Excision of the drum-head and extraction of the hammer, also of the incus," says Schwartz, "is indicated in chronic purulency of the middle ear with caries of the ossicles, and in cases of cholesteatoma of the tympanum."¹ In this he simply emphasizes what Kessel had already stated. Stacke² tells us that the operation is indicated in cases of total loss of the membrane, if, as is usually the case, remains of the hammer are still present, and granulations, exposed or roughened places of bone in the upper portion of the tympanum (attic) point to an active involvement of this region. In those cases just described, where a perforation above the short process of the hammer in the membrana flaccida exists, and which compose the most protracted cases of otorrhœa, removal of the entire membrane together with extraction of the malleus and the incus (if present), providing free drainage, will also affect a cure, says Stacke. In such cases he prefers excision of the malleus to "all other methods of treatment, the more so since the functional results of the operation are much more favorable than by the conservative treatment."

To quote from another writer³ on the subject: "When the drum is encumbered with objects now useless and diseased, but which once composed the transmitting mechanism, it is also often a reservoir for purulent secretion; in other words, the drum has lost its normal functions and has become a source of infection for the system. By excision, more or less obstruction to hearing is removed and the septic influences are eradicated."

All authorities agree from their observations that the disagreeable subjective phenomena often accompanying chronic suppuration of the middle ear, as headaches, noises in the head and ears, vertigo, nausea, etc., may be entirely relieved by removal of the diseased structures filling up the drum cavity. Sexton⁴ states: "Subjective phenomena alone, in some instances, are so distressing that the operation for their relief seems justifiable even when good hearing exists."

From the observation of many cases occurring in the practice of the last-mentioned author, the writer can readily agree in this opinion, and as to the favorable results obtained by operation in the case of these necrotic tissues.

In searching the literature of the subject it is interesting to note some of the results obtained by different operators. Schwartz seems to have been the first (1878) to undertake excision in cases of chronic otorrhœa.⁵ J. Kessel, however, reported a case of removal of the ossicles for the relief of persistent chronic purulency in 1879.⁶

¹ See also: Bezold, Friedrich, "Cholesteatoma, Perforation der Membrana flaccida Shrapnelli und Tuberverschluss, eine aetiologische Studie," *Zeitschrift für Ohrenheilkunde*, vol. xx. i. p. 5.

² *Op. cit.*

³ Sexton.

⁴ *Op. cit.*

⁵ *Op. cit.*, p. 287.

⁶ *Archiv für Ohrenheilkunde*, vol. xvi., 1880, p. 196.

absent; in the left the malleus is present, retracted and adherent to the inner wall of the drum. Came to writer in December, 1887. Hearing about the same in both ears: loud voice at two feet, and very loud voice at five feet distance. Excision of malleus of left ear June 18, 1888. Ether narcosis. The extraction of malleus was difficult on account of thick cicatricial bands running in all directions and binding the bonelet firmly to the tympanic walls. Hæmorrhage slight. Incus not found. Malleus shows evidences of caries about head and neck. No reaction, excepting a slight swelling of the canal, lasting a few days. Hearing improved slowly but surely. By the middle of November—*i. e.*, five months after the operation, he could easily hear and understand sentences spoken in ordinary voice at twelve feet. Discharge ceased in one month's time, and the membrana tympani regenerated partially. Patient was last seen in October, 1890, over two years since excision was done. The operated ear was dry and cicatricial. The improved hearing remains and his health is excellent.

CASE II.—Female, aged twenty-five years; has suffered with discharge from left ear since childhood. The right ear discharged also formerly, but is now healed. At times the discharge from left ear ceases altogether for longer or shorter intervals; then she takes a cold and the ear “gathers and breaks.” Much pain and soreness in the ear at times. Run-down, anæmic individual, nervous, and suffers much with headache. Left drum-head is absent in its lower segment, and the handle of the hammer hangs freely down into the drum-cavity. She hears in the left ear loud ordinary voice at five feet, and loud voice at ten feet only. Excision of malleus of left ear December 5, 1889. Ether narcosis. The handle of malleus adherent to inner wall of tympanum. Slight hæmorrhage only. No pain. Walls of canal swelled slightly, but soon subsided. Hearing began to improve within four or five days, as the swelling of the canal-walls subsided. A week after the operation she heard ordinary voice at ten feet. Discharge ceased within two weeks. Patient lives in the country and was not seen until November, 1890, when she came to the writer's office. Can hear now low voice easily at twelve to fifteen feet. Tympanic cavity is dry and cicatricial, presenting a glistening appearance. No regeneration of membrane. Health excellent. Never has headaches now.

CASE III.—Female, aged ten and a half years, with discharge from both ears after scarlet fever in infancy. Child much neglected, and her general condition a poor one. During treatment, continued for many months, a number of polypi were removed from both ears. The condition of these, however, remains about the same. In both drum-heads the lower portions are absent. In the right ear the malleus handle hangs freely down into the drum-cavity; in the left the head of the malleus alone remains and is firmly ossified to the tympanic plate. Hears with right ear ordinary voice at three feet, and loud at twenty feet; in left ear loud voice at three feet, and shouting at twenty feet. March 21, 1889, excision, under ether, of malleus of right ear. Extraction easy and hæmorrhage slight. The ossicle is carious and the tip of the handle is wanting. Incus not present. No reaction. Hearing showed improvement at once to low voice at two feet, ordinary at five feet, and loud ordinary at ten to twenty feet distance. By April 8th the discharge had ceased entirely and the ear was perfectly dry. Patient's health improved much after this, and when last seen, in December, 1889, she was

small spade-shaped knife, or a small straight-bladed, blunt-pointed knife may be used with advantage; the attachments of the malleus are divided with either of these instruments. The latter bonelet is then seized with a dressing forceps and brought away. Some operators prefer the wire polypus snare-loop for the removal of the malleus to the ordinary dressing forceps, but this is simply a matter of individual taste. The foreign-body forceps of Sexton has proved itself of great value for this purpose. Lucae¹ uses an instrument resembling a small lithotribe. If the articulation between incus and stapes is intact, it may be divided with a small knife the blade of which is bent at an obtuse angle to the shaft. In many cases it will be found very difficult to bring the incus down into view, and in many others this ossicle will not be found at all, having become destroyed by disease and swept out during the course of the discharge. In some cases it may become dislodged during the operation backward and upward into the mastoid antrum. Ludewig² opens the antrum in such cases where he suspects the latter accident to have taken place, in order to remove the dislodged incus, if possible. As far as his own observation goes, however, the writer considers this procedure unnecessary. For bringing the incus down into view, Kretschmann³ uses an instrument the extreme end of which is bent to a right-angle with the shaft, and having on its point a cup-like bulb. Ferrer⁴ and Ludewig have both devised small hook-shaped instruments for this purpose. An ordinary malleable probe, bent to the angle desired, is, however, very effective for the object mentioned. When brought down into the atrium the ossicle is extracted with the forceps. All adhesions and pockets existing in the tympanic cavity, especially in the attic, should be broken down, making free drainage possible. Hæmorrhage from granulations sometimes prolongs the operation, but is easily controlled by syringing with hot water. As a rule, however, bleeding does not interfere much and may be stopped by wiping out with cotton-wool tampons.

There is very rarely any pain after the operation. Should it occur, it can be easily controlled by the instillation of a few drops of a 4 per cent. solution of cocaine.

In conclusion, the writer desires to give the histories of the following three cases, operated by himself, and which he trusts may not be without interest.

CASE I.—Male, aged forty-four years. Discharge from both ears for many years. Under treatment by different aurists during past six to seven years, with no improvement to speak of.

Membrana vibrans of both ears is absent, and there is a slight amount of granulation tissue in both tympana. Malleus and incus of right ear

¹ Archiv für Ohrenheilkunde, vol. xxii., 1885, p. 233.

² Op. cit.

³ Archiv für Ohrenheilkunde, vol. xxv.

⁴ Vide Ludewig, op. cit.

they increased until they amounted to forty or fifty, the largest number in one day having been fifty-seven. There was no improvement until a few days before admission, during which time he had had only twelve daily. The fits occur in sleep as well as while he is awake. They are sometimes preceded by pain in the left elbow, sometimes by headache, now frontal, and now situated on the side of the head, over the right ear. The headache sometimes only occurs immediately before the fits, and is sometimes of longer duration. Occasionally three or more fits occur together with very little interval, but there appears to be no status epilepticus. Drowsiness, lasting for a few minutes only, often succeeds the convulsion. The right side was at first the more severely affected, but now is considerably less so than the left. The patient is perfectly intelligent.

Numerous fits were seen, both by the house physician and by the nurses, and all presented similar characters, their duration being from one and a half to two minutes. In all, with the commencement of the tonic spasm the arms were thrown over to the right side, and either both rigidly extended or the right flexed at the elbow and the left extended. The thumbs were bent into the palms. At the same time the head was violently twisted to the right, so as to look over the shoulder, and the eyes were rolled upward and to the right. Clonic convulsions followed, especially violent upon the left side, except in the face, where they occurred upon the right, and involved chiefly the zygomatici and the lower half of the orbicularis palpebrarum. The mouth was kept half open, and there was no foaming. The tongue was not bitten. Nearly all the fits were preceded by the epileptic cry. As consciousness was recovered, the patient sometimes burst into tears. There was occasionally incontinence of urine during the fits.

On examination, all the organs were found normal. The gait was awkward and unsteady; shortly after a fit there was slight exaggeration of the left patellar tendon reflex, and an approach to ankle clonus on the right side. There was a continuous dilatation of both pupils, which responded normally to light. Examined again on December 22d, one and a half hours after a fit: there seemed to be slight paresis of both upper and lower limbs, the left side being apparently a little weaker than the right. The dynamometer in the left hand registered 32; in the right 30.

The treatment, which was commenced on December 20th, consisted of rest in bed, careful regulation of the bowels, and the exhibition of antipyrine, commencing with gr. v thrice daily, and increasing by gr. j in every dose each day. On January 9, 1890, gr. xxv thrice daily were reached, and this dose was continued till January 16th, when it was diminished to gr. xx thrice daily. From the date of entrance till December 26th the average number of fits daily was 16.5; from then till December 30th, 13.2. On December 31st and January 1st there were eleven fits; on January 2d and 3d, ten fits; and on January 4th, three fits. The fits then ceased till January 28th, when the dose of antipyrine had been lowered for twelve days. There was then one slight fit, and the dose was again increased to gr. xxv thrice daily. From that time there were no more fits, and the patient was dismissed on March 1st, quite well. He continued the antipyrine at home, and a letter from his father, dated March 12th, stated that there had, up till then, been no recurrence.

in excellent condition. The operated ear was dry and cicatricial, and the improved hearing remained.

In these cases it will be seen that excision was followed not only by cessation of the disagreeable discharge, but by a very considerable improvement in hearing. The bare record of the degree of the improvement in the hearing power of such patients may not appear so great to us, but we must regard it from their point of view to properly appreciate the value of the amount gained.

The same remark, indeed, may be applied to the result of any surgical procedure. This improvement in hearing, however, in connection with the removal of the diseased and obstructing tissues, is a gratifying occurrence in the cases I have endeavored to describe. Such purulent conditions are not only disagreeable and annoying to the patient, but a constant menace to his existence. To quote from a recent German writer on this subject, "the result *quoad vitam* should be more highly valued than *quoad functionem*."

30 WEST THIRTY-THIRD STREET, NEW YORK.

CASE OF EPILEPSY CURED BY ANTIPYRINE.

BY MCCALL ANDERSON, M.D.,

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Reported by WILLIAM R. JACK, M.B., C.M.,

HOUSE PHYSICIAN.

J. M., aged nine years, was admitted to Ward 2 of the Western Infirmary on December 12th, 1889, suffering from "fits" of two and a half years' duration.

His father stated that he had previously been perfectly healthy. In both father and grandfather there was a history of so-called "hysterical fits," in the father between the ages of two and four, and in the grandfather between those of forty-five and fifty-seven. An aunt had a "stroke" twenty years ago, from which she recovered, and is still alive.

Six weeks before the first fit, the boy had a fall, bruising his head just above the right ear, but there was apparently no injury to the bone. He recovered from this in about three days, and remained well until the first fit occurred, for which the parents can think of no other cause but the fall. At the beginning of the illness he had only about four to six fits daily, but they gradually increased in number until he had as many as thirty or forty. At the same time he complained of gradually increasing weakness in his right arm, but this after a time disappeared, while the left became similarly affected. Three months afterward the fits entirely ceased, after the application of blisters to the head. An interval of fifteen months ensued, during which there were no fits, and throughout this time the general health remained perfectly good. About seven months before admission, with no apparent cause, they began again, at first only one occurring in twenty-four hours, but gradually

no evidence of laceration of the brain by the puncture. Having elevated the bones we dressed the wound with carbolyzed gauze and iodoform, leaving abundant provision for drainage. When we left the patient we did not expect to see him alive again.

From this time on the patient continued to live and did well. For a few days it was necessary to catheterize him, but after that he passed urine naturally, although he had incontinence. For a week or more his bowels did not move. We administered salts, rectal enemata, and eroton oil. Twice I gave him seven drops of the latter. Finally, his bowels moved and after that gave very little trouble.

The aphasia began to pass off after several days so that under some mental excitement he would talk freely, but his language was incoherent and consisted largely of a repetition of oaths. Usually he would say simply "Yes" or "Yah" in answer to every interrogation. There was only slight improvement in the facial paralysis. The patient was able to take plenty of nourishment and often had a good appetite. The wound was healing nicely. He gave no evidence of meningeal inflammation nor of cerebral abscess.

On December 24th I operated again, having decided to make an exploratory operation. It was evident that there was still an interference with any considerable improvement in his condition beyond that already noted. With the patient under chloroform I made ample incisions upon the site of injury and turned back the flaps of scalp and temporal muscle until I obtained a clear view of the fracture over a space of four inches square. It was then made evident that the man had received a most terrible injury. The lines of fracture passed in several directions beyond the limits of the area exposed. While attempting to lift depressed bone I found that very large plates of bone were loose. The sense of touch told me that the bones were movable over the whole area of the vertex and even beyond. It was evidently impossible to retain all the fragments in good elevation. A piece of bone (2 in fig.) which was threatening to necrose was removed. Another (1 in fig.) had been removed at the previous operation.

There was one spot where the brain resistance was less than elsewhere and which had a semi-fluctuating feel. Upon consultation it was not thought best to make further exploration. The dura mater was healthy, and the tear in it which we observed at the first operation, had healed. This wound of the dura and the spot of diminished brain resistance were about half an inch apart. We used four catgut sutures for the four arms of the X-shaped incision in the scalp. The middle of the scalp incision was left open for drainage and to avoid any cerebral pressure.

The patient was a little depressed by this procedure, but in two days rallied and began to do well. There was some improvement in the paralysis of the leg, but in other respects he remained about the same until his death on the 17th of January.

A post-mortem examination was made January 18th. Rigor mortis well marked on the left side. Body emaciated. Height 5 feet 4 inches. Well-marked contusion on outer aspect of left shoulder, of not recent date. Bed-sores over left trochanter and over sacrum and right trochanter. A few small adhesions in left pleural cavity, easily broken down. Slightly increased amount of serum in pericardial cavity. Small completely decolorized fibrinous clot in left ventricle extending into aorta. Larger partially decolorized fibrinous clot in right ventricle

This was a most aggravated case, and the result was striking and remarkable. That the cessation of the fits was directly due to the drug is shown by the fact that they were arrested when the dose of antipyrine reached twenty-five grains, reappeared when it was reduced to twenty grains, and finally ceased when twenty-five grains were again administered. For a boy aged nine years the dose was a large one; but, as regards dosage, it should never be forgotten that each case must be treated on its own merits, and that we must not be tied down to regulation doses. The rule which I invariably follow in such cases is to begin with a small dose and slowly increase, either until the medicine begins to disagree, or until the symptoms begin to yield, the patient being, however, carefully watched during the whole of the treatment. It is also of the utmost importance in cases of epilepsy to continue the treatment for a long time after all trace of fits has disappeared.

I was led to employ antipyrine from the conviction that epilepsy is a pure neurosis, from a knowledge of the powerfully calmative influence of antipyrine upon the nervous system, and from the observation of its wonderful effects in many cases of chorea, another form of neurotic affection.

EXTENSIVE FRACTURE OF THE SKULL WITH REMARKABLE PERSISTENCE OF LIFE.

By C. G. R. JENNINGS, B.A., M.D.,
BENNINGTON, VERMONT.

ON the evening of December 11, 1888, I was called to see Louis Walder, German, aged fifty-six years, woodchopper by occupation, who had received an injury of the head in a quarrel. I found him in a condition of stupor from which he could be only partially aroused. Upon examination, a contused wound of the scalp in the left parietal region was found extending down to the skull, which was fractured and depressed.

After preparation for operation, the whole head was shaved and rendered as nearly aseptic as possible. Owing to the squalor and dirt amid which I found him in his hut on the mountain side, it was difficult to make an ideal operation. With the assistance of Dr. Lyman Rogers, I explored the wound. The patient felt the knife and it was necessary to put him under the influence of chloroform. We observed that he had right hemiplegia. He also had right facial paralysis and as we afterward learned, aphasia. After removing a portion of bone which occupied the centre of the wound, we were able to raise the surrounding bones, which were depressed over an area of three inches square. We found profuse hemorrhage from branches of the middle meningeal artery. This was checked by pressure with hot sponges, but only after considerable time and much bleeding. The dura mater was punctured underneath the centre of the wound, but we did not think best to interfere with this. The puncture was small and clean, and we found

REVIEWS.

A MANUAL OF AUSCULTATION AND PERCUSSION. By AUSTIN FLINT, M.D.
Fifth edition. Revised by J. C. WILSON, M.D. Philadelphia: Lea
Brothers & Co., 1890.

It seems almost a work of supererogation to review a manual so well known to the profession, and which has with this reached its fifth edition.

Among the many treatises upon the examination of the thoracic viscera, that of Flint, as revised by Dr. Wilson, will still hold its place. As the reviser remarks in his preface, "Its value is to be discovered in the clearness and appropriateness of its style, the accuracy of its statements, its scientific method, and the practical treatment of subjects at once difficult and essential to the student of medicine."

In the first chapter, the introduction, the author refers, among other matters, to the importance of the physical signs and the morbid conditions incident to the different respiratory diseases, and gives a useful enumeration of these latter. There are also several illustrations accompanying the description of the regional divisions of the chest; and an explanation of the mutual topographical relations of the viscera found in each region.

In the next chapter, percussion in health is thoroughly discussed, and its characteristics, as found in the different regions, described. Stress is laid upon the differences in the percussion note occurring in corresponding areas upon the opposite sides of the chest. The chapter closes with practical "rules for the practice of percussion."

The same subject in its relation to disease is treated of in the third chapter, with the description of the various percussion notes which may occur, and an examination of the various pulmonary conditions producing them.

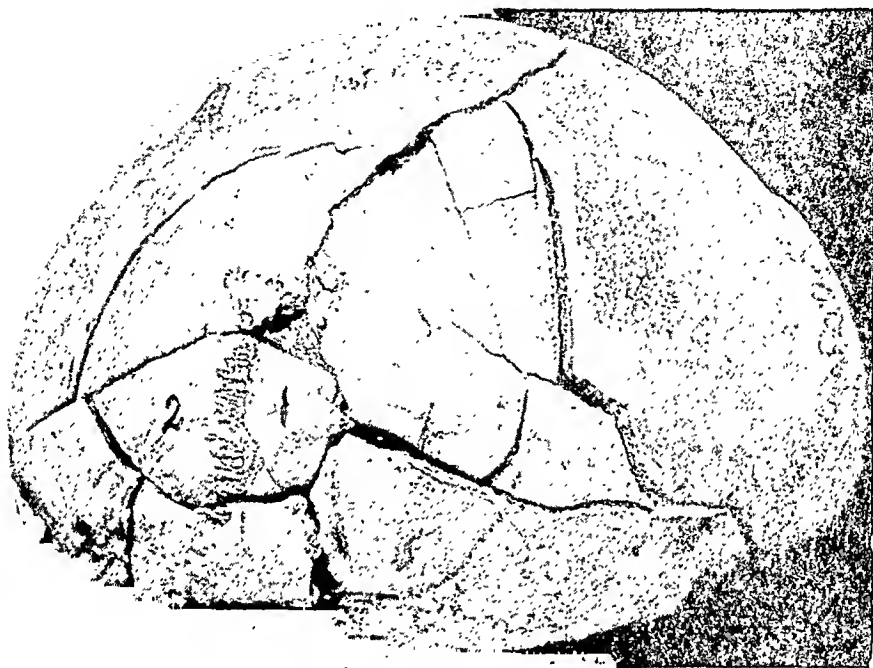
Chapter IV., on auscultation in health, opens with brief remarks upon stethoscopes; the author expressing with no uncertain voice his preference for the double stethoscope. The chapter includes "rules for the practice of auscultation," as well as descriptions of the different normal auscultatory sounds. Of particular value is the careful, concise description of the variations in the character of the respiratory murmur and vocal resonance heard at different portions of the normal chest.

The following chapter is occupied by a consideration of auscultation in disease. The author gives a systematic analysis of the various abnormal auscultatory sounds, and of the manner in which, and the conditions by which, these are produced. He calls attention to the close resemblance which he says cavernous respiration often bears to normal breathing, and denies it any participation whatever in the bronchial character.

In this particular he is, as he admits, at variance with some writers.

extending into pulmonary artery. Both lungs exceedingly cedematous and slightly congested.

Ecchymosis under the scalp diffused over a large portion of the cranium. The cranium itself fractured over the left motor tract into thirteen or fourteen pieces, four of the lines of fracture traversing the vault of the skull toward the base. These four fissures were from six to ten inches long. One passed anteriorly to the upper margin of the orbit



and was thence reflected along the base of the anterior fossa to the olfactory groove of the left side. The second fissure reached the middle fossa of the base of the skull on the left side and extended to the hiatus Fallopii. A third fissure extended backward, reaching the left half of the lambdoid suture, thence passing downward nearly to the lateral sinus. A fourth fissure or crack extended from the site of the wound across the vertex of the skull toward the right side and terminated just at the angle of the groove for the right lateral sinus, about ten inches from its starting-point. Three pieces of bone were missing from the site of the injury, having been removed at the two operations. Dura mater lacerated in three places under the three principal lines of fracture. Repair had partially taken place. Dura mater firmly adherent to pia mater in several places. Slight congestion of the pia mater.

Under one place of adhesion between dura and pia, near the vertex, is a spot of softened brain substance of small extent. In the motor convolutions of the left side, immediately in front of fissure of Rolando, is a larger spot of broken-down brain tissue and blood-clot the size of a robin's egg.

The immediate cause of death was œdema of the lungs. The ante-mortem clot in the left ventricle of the heart had not given any symptoms prior to death, excepting by its effect on the circulation in the lungs. The patient lived five weeks and two days after the injury.

ON SEVERE VOMITING DURING PREGNANCY. A Collection and Analysis of Cases, with Remarks on Treatment. By GRAILY HEWITT, M.D. Lond., F.R.C.P., F.R.S. Ed., Emeritus Professor of Obstetric Medicine, University College, etc. etc. Pp. 147. London: Longmans, Green & Co., 1890.

THIS monograph, as the distinguished author states in the preface, is based upon his able essay, which was read before the American Gynecological Society in 1889. Its object is to prove not only that the severe vomiting of pregnancy is of uterine origin, but that it is due directly to pressure upon nerve filaments in the cervix, especially around the os internum, induced by one of three factors—marked ante- or retroflexion, rigidity of the tissue of the cervix, or impaction of the body of the uterus in the pelvis. The evidence presented in support of this theory is certainly most convincing, though the thoughtful reader may object to the argument being pushed too far. When we remember that ante-flexion is the normal position of the intra-pelvic gravid uterus, we cannot overcome the suspicion that mere flexion is not enough to explain the reflex irritation in some of these cases, especially those in which the vomiting is suddenly checked by an application of nitrate of silver to an accompanying eroded cervix. But, facts are better than theories, and it must be admitted that the author presents a powerful array of the former. Those who have tried Copeman's method must admit that its success is due to something more than mere straightening of an ante-flexed uterus. It is employed quite extensively in America where the object aimed at is dilating a rigid os internum without any distinct attempt at replacing the uterus. The comparison between cases of vomiting in displacements of the gravid and of the non-gravid uterus is an ingenious one, as well as the idea that morning sickness is due to sudden pressure upon the cervical nerves, from ante-displacement of the uterus following the change from the recumbent to the erect posture.

The chapter on treatment is, as might be inferred from the foregoing, largely mechanical, replacement of the ante- or retroflexed uterus being the main object to be aimed at. It must occur to the gynecologist that the Gariel air-pessary tends rather to elevate the uterus *en masse* than to make pressure upon the fundus alone, thus correcting an ante-flexion. But here again, facts are better than theories. The dicta of such a cautious observer as Dr. Hewitt should be received with the greatest confidence, and the profession must certainly feel grateful to him for presenting this obscure, but important, subject in such a lucid manner.

H. C. C.

FLUSHING AND MORBID BLUSHING: THEIR PATHOLOGY AND TREATMENT. By HARRY CAMPBELL, M.D., B.S. (Lond.), M.R.C.P. (Lond.), Senior Assistant Physician and Pathologist to the Northwest London Hospital. Large 8vo., pp. 270, with two colored plates and seventeen woodcuts. London: H. K. Lewis, 1890.

It is rather remarkable that such a common symptom as flushing, and one so annoying, has not heretofore received more careful study,

On the other hand he describes a broncho-cavernous and vesiculo-cavernous respiration. He emphasizes, too, the diagnostic value of carefully noticing pitch and quality in prolonged expiration, and thinks that this matter has been too much neglected by medical writers. In discussing râles he speaks of the vesicular or crepitant râle as almost absolutely diagnostic of pneumonia, and believes that the crepitation often heard in apical phthisis is due to the development of a circumscribed pneumonia secondary to phthisis.

Chapter VI., on the physical diagnosis of diseases of the respiratory apparatus, takes up the grouping of the various physical signs already described. The different pulmonary diseases are reviewed in succession, and the differential diagnosis discussed. This chapter is an exceedingly valuable one, and contains so much of importance that it is impossible to analyze it here.

A striking feature in the portion of the book devoted to the study of the lungs is the frequent reference, already mentioned, to the differences obtaining between the physical signs in corresponding regions on opposite sides of the chest. This is a matter to which too much attention can scarcely be called. A further feature is the incorporation of the author's published observations upon the resemblance of the sounds produced in physical study of the lungs to those which may be artificially produced; as, for instance, by percussing a loaf of bread, and the like.

In opening the discussion of the physical study of the heart, the author first describes the physical condition of the heart in health, including its exact position in the thorax, the nature of the different heart sounds, and the mechanism of their production. He claims that the impulsion of the heart against the chest-wall is one of the principal factors in producing the first sound—a statement very largely denied at the present time. Next follow descriptions of the physical conditions of the heart in disease; the chief attention, of course, being paid to cardiac murmurs. Among the features to be noted in this connection is one at variance with the teachings of some authorities. This is, namely, the distinction which Flint makes between the mitral direct and the mitral diastolic murmurs. The former he believes to be brought about by the contraction of the mitricle just before the first sound is heard. The latter he deems the result of the passive flow of blood into the ventricle during the whole of the diastole. In the latter a stenosis of the mitral orifice is presupposed. It is a noteworthy fact, however, as Lees in a recent article in *THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES* has pointed out, that Flint years ago maintained the possibility of the production of the mitral direct murmur without the existence of any mitral disease. The abnormal sound in such a case is the result of the impinging of blood, as it regurgitates through an insufficient aortic orifice, upon the outside of a mitral leaflet. The cases collected by Lees show the truth of this almost forgotten statement.

The author opposes the view that mitral regurgitant murmurs are ever heard loudest at the pulmonary cartilage.

The last chapter of the book is allotted to the physical diagnosis of diseases of the heart and of thoracic aneurism.

A general commendation of the manual is scarcely needed. It is, as the reviser states, "already a medical classic." Both students and practitioners will find condensed in its pages most lucid instruction in the department of which it treats.

J. P. C. G.

THE TECHNIC OF LING'S SYSTEM OF MANUAL TREATMENT AS APPLICABLE TO SURGERY AND MEDICINE. By ARVID KELLGREN, M.D. (Edin.) Edinburgh and London: Young J. Pentland, 1890.

THE title of this work is misleading, as we expected to find a somewhat complete analysis of the different movements used and recommended by the venerable Pehr Henrik Ling. A better title for this work would be, "Manipulations and Swedish Movements, with Special Attention paid to Mr. Henrik Kellgren's Nerve Vibrations." The author does not thoroughly exemplify the title of the book, which can be easily understood when we consider the fact that out of 108 pages devoted to all the various movements of Ling, we find that 35 are given to the nerve vibrations devised by the writer's brother.

It is to be regretted that the author does not give due consideration to Dr. Metzger and his admirable work. In treating of the system of massage, the author differs from all other writers in almost excluding that exceedingly important manipulation, friction. There are several other manipulations and movements (recommended by P. H. Ling) used by hundreds of skilful operators from the Swedish schools totally omitted—and replaced by these omnipotent "nerve vibrations." There has scarcely been a work on this subject published lately in which the author has not referred to Henrik Kellgren's vibrations as hazardous and useless (see Kleen, Reibmayer, Gustafsson, etc.), especially when recommended as a specific for inflammation of the lungs, acute inflammatory gastro-intestinal catarrhs, peritonitis, etc. They are, however, introduced in this work with the name of the venerable originator of mechano-therapeutics as an endorsement.

Some of the illustrations are very well developed, and are of great assistance to the reader. There are many good practical hints throughout the book, and one who is familiar with Henrik Kellgren's institutions in England and on the Continent can observe that the author has had all the instruction possible from his brother Henrik, who, although himself an unusually skilful operator, has by these vibrations carried mechano-therapeutics too far, the more so as he is not a graduate of medicine.

The book has many good points, but should be read with discrimination.

K. W. O.

THE PHILOSOPHY OF TUMOR DISEASE: A RESEARCH FOR PRINCIPLES OF ITS TREATMENT. By C. PITFIELD MITCHELL, M.R.C.S. (Eng.), author of "Dissolution and Evolution and the Science of Medicine." Williams & Norgate, 14 Henrietta Street, Covent Garden, London, and South Frederick Street, Edinburgh; G. P. Putnam's Sons, New York, 1890.

It is very refreshing, in these days when so little thinking and so much observing is being done in medicine, to meet with such a book as that before us, in which the author endeavors to develop and verify a new conception of tumor disease, a conception which in its broad generalization attempts to explain all the known facts as to the structure,

The author was unable to find a single paper treating it as a distinct neurosis. He has considered his subject in minute detail, and has utilized observations upon some 550 cases of his own. Very wisely, a knowledge of the physiology involved has not been presupposed, but Part I. is devoted to the structure and function of the skin, to the vasomotor system, to blood-pressure, and to some points in the physiology of the nervous system, which are illustrated by colored plates.

He finds that there are several vascular systems in the skin, one for the papillæ, others for the sebaceous glands, for hair follicles, and for sweat-glands; that each system has a separate vasomotor apparatus, and that any one of these may be affected independently of the others. He lays particular stress upon this last point, and so accounts for sweating from a pale skin, dryness of a flushed surface, etc.

The nerve supply of the skin is, as he states, also elaborate, but that "every epithelial cell" in the glands of the body "has its nerve-twig" is rather a matter for inference than for positive statement. Secretory and trophic nerve impulses are confounded in the description of gland secretion (p. 5).

The author adopts the generalization of Hughlings Jackson, that all parts of the body are represented in the highest cerebral centres, and applies it literally in his study of the flush. This is described as a highly complex nerve-storm, of which the three typical cutaneous phenomena, sweating, chilliness, and reddening, are merely surface indications. It is not considered to be essentially vasomotor. An analysis is given of surface points where flushes begin, and a parallel is suggested with certain epileptic and hysterical auræ; indeed, attention is called to the difficulty in separating some flushes from *petit mal*. The sensations of heat and cold are considered to be independent of afferent nerve impulses. Sweating is shown to be independent of vasomotor conditions, and also of the sensation of heat in some instances. An analysis of ninety-six cases points toward the conclusion that perspiration with the flushes of the menopause is vicarious. The vast majority of flushes are found to have some relation to disordered or changing menstruation.

Physiologically, flushing and blushing cannot be separated, and the only safe distinction is that the blush is always caused by emotion, while the flush is only occasionally so caused. Morbid blushing depends upon shyness, and this upon excessive self-consciousness (as shown by Darwin), upon want of self-esteem, and upon undue sensitiveness to the opinion of others. A few cases were observed where it occurred in the dark, and when the person was alone.

About one-fourth of the book is devoted to treatment. This is considered broadly, and considerable space is given to theories of cell nutrition. Healthful development of the nervous system in childhood is of supreme importance. School life is useful in checking functional nervous disease, as compared with over-watchful home training. The treatment advised for the adult is essentially hygienic. Bleeding may benefit, especially after the menopause. Among drugs turpentine is frequently useful, especially among the poor, while iron takes a high place. Bromides have little influence.

While the work is at times a trifle theoretical, it is a careful, painstaking study, scientific in spirit and in method. The work of the publishers has been most creditably done.

G. E. S.

syphilographers, is evidently taken from Lec's protest to the view of Gowers, advanced in the latter's most interesting Lettsomian Lectures (January, 1889) on *Syphilis and the Nervous System*, that syphilis is incurable in the sense that the essential element of the disease, the virus that lies behind all the symptoms and consequences, may be totally destroyed by any treatment so that it can never again disturb the system.

The second point in the prophylactic treatment of nerve-syphilis is to sustain the nervous system of those who have had syphilis, and especially of those in whom the earliest phases of the disease escaped treatment. This Althaus does by advising, after a proper mercurial course, a prolonged holiday spent in the open air, especially at sea, and with it careful living in every particular. The curative treatment of nerve-syphilis resolves itself into the treatment of the specific lesion itself (gumma or endarteritis), and of its secondary consequences resulting from pressure or from removal of blood supply. Althaus regards mercury as a true specific in all primary nerve lesions, and believes that it cannot be replaced by any other drug, excepting, of course, potassium iodide when it is necessary to rapidly combat dangerous symptoms. The reviewer holds a similar opinion. To his mind the superiority of mercury over potassium iodide in the treatment of nerve-syphilis is due to the fact that the majority of cases of nerve-syphilis have not been subjected to a proper mercurial course before the nervous system becomes involved.

Althaus does not favor the intermittent plan of treatment. He is not in agreement with those who believe that mercury is apt to lose its effect after having been continued for a certain length of time. Experience, indeed, has taught him the reverse, that its effects are likely to be more decided rather than less when the system is kept constantly, though slightly, under its influence for many months. He prefers the hypodermic injection of a non-irritant, insoluble preparation of mercury to all other methods of introducing the metal, and the results obtained with it justify his preference. His preparation consists of metallic mercury, thoroughly triturated with lanolin and afterward well mixed with carbolized oil. This, prepared as he directs, forms a somewhat fluid, gray cream, in which all the metallic globules are extinguished. Five minims should equal half a grain of metallic mercury. He rarely finds it necessary to exceed this quantity, which he injects once weekly into the glutei muscles. He states that its injection is painless, and causes neither nodules nor abscess. We are surprised to encounter the astonishing statement that when the effects of mercury so used appear tardily, Althaus prefers giving sodium or potassium iodide coincidently, *to retain the mercury longer in the system*, rather than injecting larger doses of mercury. The effect of the iodide would be to form a soluble salt of its base and mercury, which, while producing a more prompt action, would of course be far more easily eliminated. On another page a similar statement appears, that a portion of the benefit resulting from a concurrent administration of potassium iodide is due to the iodide impeding the elimination of mercury!

Althaus regards galvanism as the most useful agent in the treatment of the secondary, ordinary lesions. It seems to improve the circulation in the affected vessels and promotes nutrition in the damaged area.

The reviewer has thus given an outline of this most excellent pamphlet; the paper itself is worth a careful reading.

D. D. S.

nature and origin of tumors. This conception is not the product of a sudden inspiration, but is an hypothesis carefully and logically worked out after years of careful thought and study. A partial exposition of the studies now presented *in extenso* was incorporated in a work previously published by the author, entitled *Dissolution and Evolution and the Science of Medicine*. The few who are familiar with the former work and who appreciate the value and importance of its generalizations will receive the present book with the greatest pleasure.

The author presents in this book, in separate chapters, "An Outline of a New Hypothesis of the Origin and Nature of Tumors;" "The Facts of Morphology;" "The General and Special Conditions of Tumor Disease;" "The Secondary Phenomena;" "The Evidence from Treatment and Heredity;" and finally "The Practical Deductions as to Prevention and Treatment." The condition of our knowledge of tumor disease in all its aspects (nature, causation and treatment) could scarcely be more unsatisfactory than it is, and scientific research in this direction is much to be desired.

It is useless, in a short review, to attempt to convey any conception of the nature of the hypothesis presented or the grounds upon which it is based; this can only be gained from a careful study of the author's presentation. It may be said, however, that it is quite worthy of careful study. The entire work is thoroughly scientific in character, and whether the conclusions of the writer are accepted or not, it cannot fail to be of the greatest interest to all who feel the need of new and broader generalizations in medicine and who appreciate any attempts to give coherence to the essentials of general and special pathological anatomy.

One criticism may be made as to the manner of expression, namely, that it partakes too much of the form affected by philosophic writers to be readily or easily grasped by the average physician. H. M. B.

THE TREATMENT OF SYPHILIS OF THE NERVOUS SYSTEM. By JULIUS ALTHAUS, M.D., M.R.C.P. (Lond.), Senior Physician to the Hospital for Epilepsy and Paralysis. London: Longmans, Green & Co., 1890.

ALTHAUS recommends that the treatment of nerve-syphilis should be first prophylactic, and second, curative. The prophylactic treatment should be pursued on two different lines. The first and most important of these is the destruction of the virus at the onset of the disease, both by excision of the primary sore whenever practicable, and by the efficient administration of mercury in the earlier stages before the disease encroaches upon important organs. He holds, with Henry Lee, Fournier, and others, that mercury efficiently administered in the earlier stages of syphilis acts as a true germicide, leaving the patient's constitution as uninjured as if the disease had never been contracted. On this point he quotes Mr. Lee, who states that: "If by being cured is meant that patients after proper treatment remain in future free from symptoms, do not infect their wives, have healthy families, and live as long as others, then I firmly maintain that syphilis is as curable as any other disease." This quotation, which expresses the view generally held by

what tantalizing, by reason of its extreme brevity. The professional reader will be disappointed at not finding a more detailed description of the operator's *technique*, but, from McDowell's remarkable modesty and aversion to publishing the results of his work, we are left in ignorance with regard to just those facts which would have been of greatest interest. We are told (on page 78) that "upon three different occasions he crossed the Atlantic Ocean to do the Cæsarean section," but that "he never made report of these performances, and the members of his family were the only persons that knew the object of his missions abroad." Considering what a formidable undertaking an ocean voyage was at this time, this is an astounding statement, which should have been carefully verified, especially as there is no record of it elsewhere. How unfortunate that so much of the work of this remarkable surgeon should be unknown, when that of lesser men fills volumes! That work seems more comprehensible to us when we study his character, a character which was cast in heroic mould and must serve as an inspiration to all.

In the latter three-fourths of this volume we do not feel the same absorbing interest as in the strictly biographical portion. Much time and labor have been bestowed upon the collection of various facts and individual opinions bearing upon the subject of ovariectomy—which are, however, not without historic value.

The style of the authoress is somewhat florid, but is clear and pleasing. The typography and binding of the volume are among the best examples of the printer's art, so that it is almost an *édition de luxe*. H. C. C.

QUIZ COMPEND ON ANATOMY. By S. O. L. POTTER, M.D. Philadelphia: P. Blakiston, Son & Co., 1890.

THE fifth edition of this *Compend on Anatomy* is before us, and is practically the last edition, with tablets and plates of the arteries and nerves (spinal and sympathetic) in outline, with the name either on or near the artery or nerve, added as an appendix. The tablets are systematically arranged and concisely worded, making the compend alike suitable for first-course as well as for advanced students. As the work now stands, it is well fitted for a general review of anatomy, but not suitable to be used by students to dissect from, which function it is very frequently supposed to perform by first-course students, on account of its numerous illustrations. It should not be used as a substitute for a text-book on anatomy, as has been done. A. H.

DISEASES OF THE EYE. By EDWARD NETTLESHIP, F.R.C.S., Ophthalmic Surgeon to St. Thomas's Hospital; Surgeon to the Royal London Ophthalmic Hospital (Moorfields), etc. Fourth American, from the fifth English edition. With a chapter on Examination for Color Perception. By WILLIAM THOMSON, M.D., Professor of Ophthalmology in the Jefferson Medical College of Philadelphia. Philadelphia: Lea Brothers & Co., 1890.

THE popularity that Nettleship's work has achieved fully supports the good things that the reviewers have said of former editions, and leaves but few who require to be introduced to its merits. The changes from the matter of the last edition are comparatively slight, as might be expected from the slight advance that ophthalmic science has made in the brief period that has elapsed since the appearance of that edition. There have been some new cuts substituted for old ones, and a most notable improvement in the colored plate given to show the colors of the test and confusion skeins of Holmgren's test for color-blindness. Some change of attitude is apparent toward iridectomy in cataract extraction, but the after-treatment is still made to include the "partly-dark" room and the bandage.

The appendix giving formulæ, descriptions of instruments, etc., continues to be a valuable portion of the work. But, probably through an oversight of the publishers, it is rather overloaded with the name of a firm of opticians; and one, too, that has incurred the just disfavor of the medical profession. To refer to this firm as one from which Snellen test-types, and other such articles in universal use, may be obtained, and to repeat their name and full business address three times in a dozen consecutive lines, is certainly unnecessary for instruction of the reader.

E. J.

THE BIOGRAPHY OF EPHRAIM MCDOWELL, M.D., "THE FATHER OF OVARIOTOMY." By his Granddaughter, MARY YOUNG RIDENBAUGH. Pp. xvi., 558. New York: Charles L. Webster & Co., 1890.

THE American reader will open this volume with no little interest, since it promises to give him a deeper insight into the life of one who stamped the impress of his genius upon medicine for all time. McDowell is one of the heroic figures in which the history of our profession abounds, and the authoress has placed us under no common obligation in writing his biography.

Every work of this character contains more or less irrelevant matter which could be omitted with advantage. The first hundred pages really include all the biographical portion, and will be of special interest to the profession, who are already sufficiently familiar with the history of ovariectomy and the opinions of eminent specialists, living and dead. Mrs. Ridenbaugh has executed her own part of the work very creditably, since she has given us a graphic picture of the private life of the great surgeon, the motives which governed him, and the almost superhuman courage which led him to attempt seeming impossibilities. Chapter V., containing an account of the historic first case of ovariectomy, is some-

From *local application* the amount which will cause poisoning varies with the part with which the drug is brought in contact.

The smallest dose which caused alarming symptoms when injected into the *bladder* was fifteen grains, though eighty grains did not cause as serious symptoms in another patient.

In the *urethra* the injection of fifteen drops of a 3 per cent. solution ($\frac{1}{3}$ grain) caused very threatening symptoms; in another case in which twelve grains were injected into the urethra death followed in twenty minutes. After application to the *uterus* of two grains in one case, and nearly three grains in another patient, toxic symptoms were caused. Applied to the *rectum*, death followed after the use of eighteen grains.

After the use of cocaine in the *nasal* cavity, serious poisoning followed only one-fifth of a grain.

In the *ear* five drops of a 5 per cent. solution ($\frac{1}{3}$ grain) caused marked symptoms.

In the *mouth* and *throat* half a grain, three drops, of a 20 per cent. solution in a tooth proved sufficient to cause unconsciousness. One-twelfth of a grain under the gum was followed by opisthotonus and irregular breathing.

Brushing the *pharynx* with a 4 per cent. solution was sufficient to cause poisoning in several cases.

Surprisingly small amounts caused symptoms from absorption through the *conjunctiva*, one-sixteenth of a grain (two drops of a 4 per cent. solution), and in a boy of fourteen one-tenth of a grain, or one drop of a 1 per cent. solution. (Cyanosis of the lips, paleness, profuse sweating, slow, small pulse.) Two-thirds of a grain injected under the conjunctiva in a woman seventy-one years old was followed by death in five hours.

As regards the use of the remedy *subcutaneously*, the variation in the effects with the site of the injection is not so obvious as when applications to the various membranes are made. The observations made by Wölfler, in 1889, showed, out of 23 cases of poisoning by cocaine, 19 were about the head, 1 in the larynx, and the remaining 3 were not considered, as an excessive quantity (over two-thirds of a grain) had been used. From the cases reported by Dr. Falk, however, injections about the head are not so much more dangerous than into other parts. He found 28 cases where these injections were made into the trunk, 9 into the extremities, and 7 into the head. If to these last we add 36 cases where the injections were made into the gums and 5 cases where the injections were made into the conjunctiva, we have a total of 48 injections into the head, to contrast with 37 cases where the injections were not made into that part. The amount injected into the trunk and extremities was not excessive—that is, three grains were exceeded only five times—and in injections about the head this quantity or more was given six times. The smallest amount which caused symptoms in each case was two-thirds of a grain into the trunk, one-sixteenth of a grain into the forearm, and rather more than two-thirds of a grain into the head.

From the cases here collected it would seem that we are not justified in considering that the site of the subcutaneous injection affects the possible toxic results.

The local use of cocaine varies in its effects with the rapidity of absorption

THE
PROGRESS
OF
MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF
FRANCIS H. WILLIAMS, M.D.,
ASSISTANT PROFESSOR OF THERAPEUTICS IN HARVARD UNIVERSITY.

EFFECTS OF COCAINE.

DR. EDWARD FALK, of Berlin, has made a study of the effects and dangers of cocaine which has a very practical interest for all medical men, as it is so universally used. There is hardly a substance about which there are so many opinions as about this drug, especially in regard to what is the safe amount to use under the various conditions which prevail in practice; at one time large amounts, up to fifteen grains, are well borne and cause no disturbance; in other cases a fraction of a grain may produce toxic symptoms. The character of the symptoms may also vary widely; it may cause excitement, or in other cases stupor; hallucinations may follow its use; it may induce coma; at times convulsions may be the result, at others paralysis.

Dr. Ehrich's opinion that cocaine as a local anæsthetic is one of the greatest discoveries of modern medicine, is in marked contrast to Dr. Erlenmeyer's verdict, that in its capabilities for harm it is second only to alcohol.

The number of those who have experienced the acute ill effects of cocaine is already large, but still greater is the number of those unfortunates who have become subjects of its habitual use.

Dr. Falk has collected the details of one hundred and seventy-six cases where serious symptoms were produced by the use of cocaine, and among them are ten fatal cases. His tables are too full to be given here.

The smallest dose of cocaine which produced toxic symptoms when taken by the *alimentary canal* was two-thirds to nearly one grain (one case). Death followed in one hour after eighteen grains in one case, and in another twenty-two grains caused death in twenty minutes. In one case very serious symptoms followed fifteen grains, though the result was not fatal.

crystallization seems to be absolutely essential to secure a uniform and harmless physiological action.

The authors further conclude that if salicylic acid be prepared from synthetic carbolic acid, having a melting-point of 42° C., it then contains no impurity; but this pure carbolic acid is about three times the price of the ordinary form used, so that until this can be purchased at a cheaper rate, a more economical plan is to produce salicylic acid from ordinary carbolic acid, and subsequently to purify it. A pure salicylic acid should have a melting point of 157° C., and should occur in the form of white, separate, prismatic crystals—inodorous, tasting at first sweetish, then acid; soluble in about five hundred parts of cold water and fifteen of boiling water; readily soluble in hot chloroform; soluble in chloroform and ether. Melting-point about 157° C. Dose, ten to thirty grains.

The purified salicylate of sodium should be made by the action of the purified salicylic acid on carbonate of sodium, and should occur in the form of well-defined, white, odorless crystalline scales, having a sweetish saline taste; soluble in nine-tenths part of its weight in water, or in six parts of rectified spirit. Dose, ten to thirty grains.

There can be no doubt but that much of the disrepute which has attended the administration of salicylic acid and its salts in rheumatism has been attributable to impurities resulting from the employment of the unpurified artificial acid; and it would seem from the results of Dr. Charteris that if the pure acid only be employed, its administration might be pushed to the full extent without risk, and that we may almost conclude that we have in it an absolutely reliable, safe, and almost specific cure for rheumatism and rheumatic affections. More than this, the use of salicylic acid is not confined to medicine, but has been largely used the world over for the preservation of food substances. If, therefore, it be true that commercial salicylic acid is poisonous, and the cause of its toxicity has been discovered, the importance of these facts cannot be overestimated. It is true that in France we find the use of salicylic acid for food preservation condemned as illegal, but there is no doubt that it is largely so employed. Moreover, it appears that the greater part of the salicylic acid sold in Europe is made in Germany, and the manufacturers there practically admit that they are selling an impure article; for they place on the market what they term a crystalline acid for twelve cents a pound more than the commercial article, and an article which they term a pure acid at seventy-five cents per pound more than the former. It is, therefore, almost self-evident that the cheaper article, which is used for commercial purposes, is artificial salicylic acid contaminated with para-cresotic acid. It has been stated that, in Germany especially, the beer, which is used so freely there, contains a considerable quantity of artificial salicylic acid, which, if true, would, without doubt, charge the salicylic acid with the intoxication which may follow its employment, rather than the small amount of alcohol contained in it.—*Therapeutic Gazette*, No. 1, 1891.

CHLORATE OF POTASSIUM POISONING.

DR. LANDERER, assistant in the medical clinic of Prof. Leube, Würzburg, reports a fatal case of poisoning in a young man eighteen years old, after

of the membrane to which it is applied. The conjunctiva is a very rapid channel, after that the order would be nose, larynx, mouth, and ear, in which group up to one-third of a grain in general may be used; then come the urethra, uterus, and rectum, for which a maximum dose is one and a half to two grains.

For the intact bladder fifteen grains may be injected without danger.

Old women who are poorly nourished, and youthful patients who are nervous and anæmic, are especially susceptible to the action of cocaine.

The local use of cocaine in the eye sometimes causes a cocaine conjunctivitis, characterized by acute swelling and redness of the skin of the eyelids.

To avoid the toxic symptoms it is advisable, with anæmic patients, to have them lie down and breathe a few drops of nitrite of amyl.

Disease of the heart and bloodvessels, especially atheromatous processes and fatty degeneration of the heart and pernicious anæmia, are contra-indications.

The treatment should be warm drinks, sinapisms over heart and stomach, in case of marked vasomotor stimulation, inhalation of amyl nitrite; for convulsions, chloral hydrate, chloroform and opium; if breathing fails, artificial respiration.—*Therapeutische Monatshefte*, Nos. 10 and 11, 1890.

PHYSIOLOGICAL ACTION OF THE CONSTITUENTS OF THE ARTIFICIAL SALICYLIC ACID OF COMMERCE.

PROFESSOR DUNSTAN and MR. BLOCH, with PROFESSOR CHARTERIS, of the University of Glasgow, have made a careful investigation into the constituents of artificial salicylic acid and their physiological action.

In 1886 it was discovered that the administration of the artificial salicylic acid made from carbolic acid, however much it may have been dialyzed and purified, rapidly produced results resembling delirium tremens; and since then many reports of bad symptoms following its use have been published in the medical journals, so that it is now generally admitted that the artificial salicylic acid and its salt of sodium are dangerous to animal life, while natural salicylic acid and its salt of sodium are not. Further, it has been shown that the difference is attributable to an impurity in the artificial acid, not a trace of which exists in the natural salicylic acid. The character of the impurities in the artificial salicylic acid, or the nature of the toxic principles contained within it, were not recognized, however, until they were separated by Professor Dunstan. He has separated from the artificial salicylic acid three acids, which he recognizes as meta-cresotic acid, ortho-cresotic acid, and para-cresotic acid.

The physiological action of these acids was tested by Dr. Charteris, who found that the ortho- and para-cresotic acids are slow but certain poisons, causing prostration and paralysis, affecting first the hind legs, and extending gradually over the body. The lethal dose for the rabbit is about one grain per pound of body weight. The meta-cresotic acid was found to be innocuous.

As the melting-point of artificial salicylic acid is 157° C., the conclusion from these experiments seems to be that the high melting-point is not the only or the best test for purity, but a stronger test is required, and this is, that the artificial crystals should be identical with those of the natural variety, for

three drachms daily. The purgative effect is very pronounced, and in one case the patient had fifty-six evacuations in one week. In another case, it produced a well-marked rash, covering the arms and legs with an eruption which forcibly reminded one of a copaiba rash. It was accompanied by intense itching, which disappeared on discontinuing the drug. The guaiac not infrequently gives rise to a burning sensation in the throat, and to obviate this he prescribes ten grains of the resin in half an ounce of extract of malt. He believes that a trial of guaiac, either as a laxative or purgative, according to the dose employed, will be found satisfactory. It is possible that if the drug were triturated with cream of tartar, or with some inert substance, such as sugar of milk, its efficacy would be increased, and that it would produce the desired effect in smaller doses.—*Medical Progress*, No. 24, 1890.

TREATMENT OF OBSTRUCTION OF THE BOWELS BY LARGE DOSES OF OLIVE OIL.

DR. E. W. MITCHELL, of Cincinnati, reports two cases of successful treatment of obstruction by means of olive oil, this method of treatment being the result of a suggestion of Prof. Langdon. One of the patients, a man fifty-three years old, had had an operation for strangulated inguinal hernia on the left side, twenty months previously. When seen for his present trouble he had not been well for a day, there had been severe colicky pains and vomiting after each attempt to take food. Enemata were given on this and the following day with little result. Morphine was given, and large enemata through a rectal tube, introduced as far as possible, produced no effect. Almost two quarts of dirty fluid was withdrawn through a stomach tube. Two ounces of sweet oil were ordered to be taken every hour. Tympanites during the afternoon and early evening had rapidly increased. There was much prostration, no nourishment having been retained. During the night, half a pint of oil was taken. In the morning there was less prostration; there had been a small fluid passage. An enema, now administered through a rectal tube (English gum catheter, No. 16) returned slightly discolored, and containing a trace of oil. There was a recurrence of vomiting, but the oil was continued. About noon the bowels began to move, and several fluid stools were passed during the following night. On the next day the stools became formed and contained pus in small quantities. The case was probably one of fecal impaction,—there were no evidences of typhlitis or perityphlitis.

The second case was that of a young man twenty-two years old. The bowels had not moved for forty-eight hours, and he had been suffering from tormina and vomiting. Large doses of cathartics had already been taken. Thorough examination failed to find any evidence as to the point of obstruction; the hernial openings were clear, there was no point of tenderness, no tumor, the abdomen was quite tympanitic. He was treated by sulphate of magnesia, repeated clysters through a rectal tube introduced as far as possible into the bowel, and sufficient morphine to control extreme pain. This treatment was continued for two days with no benefit, the tympanites increasing, vomiting becoming stercoraceous, and the patient much prostrated. The administration of sweet oil was then begun; a pint was taken within a few hours, most of which was retained, although he had before been vomiting

taking an ounce of chlorate of potassium. It was intended to be used as a gargle, but he dissolved the salt in a glass of warm water, and drank the whole of it in two portions within half an hour.

The first symptoms, which came on shortly after the ingestion of the drug, were weakness, thirst, and dizziness; the more serious symptoms, the result of the action of the salt upon the blood, were acute anæmia, dyspnœa, cyanosis, continued vomiting, pain in the hypochondrium and near the umbilicus, icterus; liver and spleen both enlarged.

The amount of urine was very small, three and a quarter ounces in seven days, and contained little or no chlorate of potassium. It contained much albumin and sediment. The patient died on the sixth day, without convulsions or other uræmic symptoms.

The autopsy, made by Prof. Rindfleisch, gave the following: Œdema et hypostasis pulmonum, nephritis acuta cum infarctu hæmoglobinurico ex intoxicatione kali chlorici. Gastritis acuta, erosiones ventriculi. Enteritis et colitis acuta follicularis cum erosionibus in jejunum.

The case was under observation from the beginning, and was studied carefully, and the author gives much detail at length, besides some discussion of the observations of others. His conclusion is that chlorate of potassium should be excluded from our list of remedies, and certainly never used for children. —*Deutsches Archiv f. klinische Medicin.*

PERMANGANATE OF POTASSIUM AS AN APPLICATION TO THE BITES OF POISONOUS INSECTS.

DR. S. F. DUPON, of Fort Havach, Ga., writes that he has used permanganate of potassium with striking success as an antidote to the venom of poisonous insects and fish. A solution in glycerin (5ij-5i) is applied externally, and has given speedy and positive results in his hands. Saleratus is also useful in similar cases, and he recommends its use when the permanganate is not at hand. It should be made up into a paste with water, and applied to the bitten part.—*Medical Record*, No. 1, 1891.

GUAIAIC AS A LAXATIVE.

DR. MURRELL (*Medical Press and Circular*) thinks that guaiac is a valuable laxative. His attention was drawn to the subject, two years ago, by casually prescribing guaiac lozenges made up with black-currant paste for a man suffering from rheumatism. This patient continued taking the lozenges long after the pain had ceased, and in explanation said that they did him good by acting on the liver and bowels, and that one or two of the lozenges, taken in the morning before breakfast, produced a stool promptly and without inconvenienc. The author ordered the lozenges for others of his patients suffering from constipation, and what is conventionally called "biliousness," and the results were equally satisfactory. The lozenges not being available for hospital use, he had a confection prepared containing ten grains of guaiac resin to one drachm of honey. This, for the last two years, he has used extensively, not only as a purgative, but in the treatment of chronic rheumatism, sciatica, tonsillitis, dysmenorrhœa, and allied affections. The dose may be one to

relatively infrequent. Its study is difficult because the lesions so closely resemble those of tuberculosis. The pulmonary complications of syphilis belong especially to the third stage, and appear in two forms: as a diffuse sclerosis, the less common, and as circumscribed gummata. In addition, there is always fibroid thickening of the related pleura. The changes are usually confined to the lower lobes. More rarely they appear at the base of the upper lobe, and only exceptionally at the apex. With them may be associated syphilitic lesions of the air-passages, of the mouth, of the testicles, or even of the brain. The fibrosis of the lung is not homogeneous in its distribution, but appears in dense bands following the lines of lymphatics or radiating from a bronchus or bloodvessel. The intervening tissue is indurated or emphysematous, but not pigmented. The bronchi are compressed and the alveoli filled with leucocytes and desquamated cells. The bronchi may ultimately undergo dilatation. Of gummata, there are rarely more than eight or ten present in a lung. They vary in size from a pea to a large nut, and consist of a central and peripheral zone. The former is made up of disorganized elements, hyaline and slightly granular, surrounding a bloodvessel, which may be recognized by its elastic membrane and some blood corpuscles within its contracted lumen. The peripheral zone is made up of small, round cells, resembling the elements of embryonal connective-tissue, and of a large number of fusiform cells and vessels, of which the walls are thick but the lumen free. The process is thus a peri-arteritis, extending eccentrically, ultimately invading also the other tissues of the vessel and narrowing its lumen, as a consequence of which the centre of the gumma becomes granular and fatty. This central portion may become dry and undergo absorption with subsequent cicatrization, or it may undergo softening and ulcerate into an adjacent bronchial tube. The condition is to be distinguished from the condensation of tuberculosis, of lepra, and of impaludism. When the process in the lungs is tuberculosis it is usually seated at the apex, attended with caverns and infiltration in the neighborhood, with miliary granulations, having peculiar histological and bacteriological characters. If the pulmonary fibrosis is leprous there are other external evidences of lepra, and it may be possible to find the bacillus of lepra in the sputum. The fibrosis of impaludism is compact and uniform, and has a marbled appearance, with a bright, glistening section. The lung is enlarged.

The existence of the disease may escape most careful observation. There may be slight impairment of the percussion resonance, with increased resistance, over irregular areas at the lower half of the chest, feebleness of vesicular murmur, perhaps râles, and rarely a friction-sound. Cough, at first dry, may become moist, with muco-purulent expectoration and possibly hæmoptysis. Dyspnoea and oppression may also be present. Fever is absent, unless there be ulceration or suppuration. The face is pale, but not cachectic. Emaciation is not decided unless the liver and spleen are also involved.

The diagnosis is extremely difficult. It depends upon the localization of the lesions in the lower half of the lung, the recognition of lesions in other parts of the body or a history of syphilis, the absence of fever, of emaciation, of tubercle bacilli in the sputum. The treatment does not differ from that of syphilis under other conditions.

everything. Three hours after beginning the oil the bowels began to move, and a good recovery ensued.

Dr. Langdon mentions in the same journal eight cases where relief had been obtained from large doses of olive oil.—*Cincinnati Lancet-Clinic*, No. 3, 1891.

MEDICINE.

UNDER THE CHARGE OF

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CARDIAC NERVE-STORMS; ESSENTIAL TACHYCARDIA.

In a paper read before the Philadelphia Neurological Society, WOOD (*University Medical Magazine*, March, 1891) discusses the subject of cardiac nerve-storms, with especial reference to essential tachycardia. "Nerve-storm" is a convenient clinical designation for a sudden, violent, temporary disturbance of the nervous system, either sensory or motor. The attacks of migraine, of angina pectoris, and the crises of locomotor ataxia, are examples of sensory nerve-storms; the paroxysms of epilepsy and of tachycardia, examples of motor nerve-storms. Tachycardia, or excessive rapidity of cardiac action, may result—(1) from paralysis of the pneumogastric nerve, (2) from reflex influences, or (3) as a part of a neurosis. Such a condition, however, is not a true nerve-storm. To distinguish the latter from the former the name paroxysmal tachycardia is given to the true cardiac motor nerve-storms, with the qualification "essential" when no etiological or exciting moment can be recognized. The condition shows no tendency to shorten life or to develop organic disease, and is compatible with great mental and physical activity. The paroxysms recur at varying intervals, are unattended with pronounced pain or excessive distress, and may sometimes be arrested by the injection of cold or hot fluids, by a deep inspiration, or by other procedures which stimulate the cardiac inhibitory centre. There is a curious parallelism between the tachycardiac nerve-storm and the epileptiform convulsion. Wood believes the mechanism of tachycardia to be dependent upon a discharging lesion affecting the centres of the cardiac accelerator nerve.

PULMONARY SYPHILIS.

LANCEREAUX (*L'Union Médicale*, January 29 and 31, 1891) has presented an able contribution to the subject of pulmonary syphilis. The condition is

away. When it is desired to use the serum the ends of the bulb are broken and one or two cubic centimetres (fifteen to thirty minims) taken up into a syringe. The injections were made in some fifty cases during six weeks by Langlois, Héricourt, and Saint-Hilaire. The results obtained have been encouraging. The injections have been unattended with accident, local or general, with fever, or with syncope. They are entirely inoffensive. Without theorizing as to the mode of action of the serum of dogs' blood, Richet believes that it contains substances chemically antagonistic to the development of the bacillus tuberculosis.

AORTIC ANEURISM COMMUNICATING WITH THE SUPERIOR VENA CAVA.

ORD (*British Medical Journal*, February 21, 1891) presented to the Pathological Society of London a specimen taken from a man of forty-three, without a history of alcoholism or syphilis. Six months before death the patient had perceived a sensation of pricking in the right side of the chest, with dysphagia and inability to lie on the left side. The face and ears became livid, the right side of the neck and chest œdematous, with turgid, superficial veins. There was no visible tumor of the chest, but the percussion-note was dull from the right border of the sternum outward, between the upper borders of the second and fourth ribs, over which area there was pulsation but no thrill. Auscultation revealed a long, continuous humming murmur of varying intensity, more sonorous during the cardiac systole, fainter during diastole, conducted into the neck and heard over the entire posterior aspect of the right chest. The area of cardiac dullness was increased, and there was an apical, musical, systolic murmur distinct from the continuous murmur. The radial pulses were equal, the arteries thickened. There was neither ascites nor anasarca. There were at first signs of improvement, but subsequently the facial œdema and the dyspnoea increased and death occurred rather suddenly. At the autopsy the right pleural cavity contained about eight pints of blood, which was found to have come by a small opening from an aneurism about the size of an orange, situated two inches above the valves of the aorta. The cavity of the sac of the aneurism, which contained only a little pale, adherent clot, communicated by a slit about half an inch long, with the superior vena cava two inches below the union of the innominate veins. The first part of the aorta also was unhealthy. In the discussion it was brought out that murmurs simulating that described are occasionally heard over vascular sarcomata within the thorax and elsewhere.

IDIOGLOSSIA.

DR. HALE WHITE and MR. GOLDING BIRD brought forward (Royal Medical and Chirurgical Society, March) two boys, brothers, thought by their parents to be suffering from deaf-mutism. This was not so; they heard well and expressed themselves in articulate sounds. These sounds were unlike those of any known language, but the same sound was always used by the same child to express the same word. Each child had thus a language of its own, and the authors have (at the suggestion of Dr. Perry) named the condition "idioglossia." The elder sister of these boys was slightly affected. All the

THE PHENYL-HYDRAZIN TEST FOR SUGAR.

HAVILBURG (*Centralbl. für klin. Medicin*, January 31, 1891), of Rio de Janeiro, proposes a modification of the Fischer-Jaksch test for the presence of sugar in the urine, which he considers more reliable. Two parts of phenyl-hydrazin hydrochlorate and three of sodium acetate are added to half a test-tubeful of water, to which a like quantity of urine to be tested is added. Instead of boiling over a water-bath the mixture is shaken with chloroform. In a little time the fluids separate. If sugar be present canary-yellow crystals appear in the upper layer. The reaction is more striking if the fluid is boiled and permitted to cool before the addition of chloroform. Havilburg suggests that the procedure might be adapted for use as a ready means of quantitative determination of the amount of sugar present.

SERUM OF DOGS' BLOOD IN THE TREATMENT OF TUBERCULOSIS.

Having observed that subcutaneous injections of cultures of the staphylococcus pyosepticus caused death in rabbits, while dogs escaped, RICHET (*L'Union Médicale*, January 31, 1891) found that transfusion of dogs' blood into the peritoneal cavity of rabbits conferred upon the latter immunity against the staphylococcus pyosepticus. Reasoning in the same line, Richet conceived that injections of the blood of an animal refractory to tuberculosis into a susceptible animal would confer upon the latter immunity against tuberculosis. Ten rabbits were given intra-peritoneal injections of dogs' blood, followed by injections of cultures of the bacillus tuberculosis, and ten others, for control, received the latter without the former. At the end of three months the rabbits of the first series had gained weight and become plump, while of those of the second some were dead of tuberculosis and others were emaciated. At the end of six months, however, the surviving rabbits of both series were all tuberculous and in the same apparent condition. The conclusion is, that intra-peritoneal injections of dogs' blood in rabbits retards but does not prevent the development of tuberculosis. But one injection was made in each instance, which if repeated might indefinitely retard the development of the disease. It was now proposed to apply the method, modified, to man. The serum of dogs' blood was separated and injected under the skin. To obtain the serum, the carotid artery of a dog is exposed, a ligature placed above, a forceps below the point at which the vessel is to be cut, a sterilized glass canula introduced into the proximal end of the vessel and connected by a rubber tube with a Pasteur bulb. The forceps is removed, one bulb filled, closed with a plug of cotton, and another filled, and so on. The bulbs are put aside for twenty-four hours. Corpuscles and fibrin gravitate to the bottom. The serum floats on top. So as not to be obliged to kill a dog for each injection or to sacrifice a bulb, Richet has had made smaller bulbs, each with a capacity for sufficient fluid for one or two injections. These are oval, elongated, and terminate at each extremity in a fine tube. To fill one it is plunged by one extremity into the serum which is aspirated at the other. For preservation, the extremities are sealed in the flame of a lamp. To be sure that the fluid is sterile it is placed for forty-eight hours in a steam chamber. If, at the end of this time it is still limpid, it is kept, but if turbid it is thrown

DR. WILKS thought it was a question of speech rather than of language.

DR. HALE WHITE, in reply, defended the term idioglossia. He regretted that nobody had been able to associate the condition with the left-handedness that was present in so many of the cases. In his cases there had been no physical defect except possibly some nasal obstruction in one case.

THE SO-CALLED PARASITIC BODIES IN EPITHELIOMA.

In connection with what has appeared in the journals of late with reference to the parasitic nature of epitheliomata, the observations of WELCH (*Johns Hopk. Hosp. Bull.*, 1890, 97) are of great interest. He has found specimens of carcinomata whose cells contained bodies which very closely resembled in appearance and behavior with coloring reagents many of those which have been spoken of as microorganisms. He describes some of the bodies of different shapes and different characteristics which he has observed, and says that while their nature cannot always be satisfactorily determined, it is entirely premature and unwarranted, on any evidence yet brought forward, to regard them as sporozoa or other forms of parasites. Many of these bodies, so far as flat-celled epithelioma are concerned, can be explained:

1. As masses of keratin, a part of the protoplasm having undergone in a circumscribed area the keratine metamorphosis, while the rest remains granular.
2. As irregular masses of eleidin or kerato-hyaline.
3. As included leucocytes undergoing degenerative changes, with or without fragmentation of nuclei.
4. As scattered nuclear fragments derived from the preceding.

Just as epithelioma is essentially a typical growth of epithelium, so it is not surprising to find various typical metamorphoses of the epithelial cells in it.

PULSUS BIGEMINUS COMPLICATED BY A QUADRUPLE AORTIC MURMUR.

J. WALLACE ANDERSON (*Glasgow Medical Journal*, February, 1891) has reported the case of an adult, with a history of three attacks of rheumatism, who presented the signs of aortic obstruction and regurgitation. While under observation, during paroxysms of epigastric distress associated with digestive derangement, there was heard what is described as one long murmur distinctly broken up into four component parts. The first was most marked, the last next in intensity and most prolonged, while the intermediate two appeared to be equally faint, soft and short. The radial pulse was bigeminous, a weaker impulse following quickly each primary beat, succeeded in turn by a longer interval and a repetition of the primary beat. While under treatment with salicylate of sodium for rheumatic pains, the patient suddenly died. An autopsy was not permitted.

The *pulsus bigeminus* has been described by Traube and by Hyde Salter. Guttman asserts that it is almost exclusively associated with obstruction to the circulation, such as may be caused by valvular defects. Anderson, on the other hand, takes the position that the abnormality is a functional neurosis, dependent, in his particular case, upon derangement of innervation affecting the pneumogastric and sympathetic nerves, as it manifested itself after the appearance of symptoms of dyspepsia and vanished with their disappearance.

children were remarkably intelligent, and could read any book and understand what they read, and wrote English correctly. There was no observable physical defect. One of them was left-handed. There were traces of insanity in the family. The treatment adopted had been careful oral training.

After referring to several points of interest in connection with these cases, the authors discussed the nature, origin, and treatment of the affection, and referred to several other recorded cases.

DR. FREDERICK TAYLOR reported a similar case. The boy was aged eight and a half years, and had no physical defect beyond very slight arching of the palate. He had never talked properly, and when he first came under observation was almost unintelligible. He, however, understood what was said to him, could read short words, and could write in a child's round hand. When first seen his pronunciation of many consonants, especially p, t, k, s, was defective, and he added the syllables "ida," "eda," to nearly every word that he spoke. He had been submitted to a modified oral instruction, and was after some months much better.

His pronunciation of the Lord's Prayer on December 20th and February 3d was as follows:

	<i>Our</i>	<i>Father</i>	<i>which</i>	<i>art</i>	<i>in</i>	<i>heaven,</i>
<i>Dec. 20th.</i> —	Ouarda	farada	id	arda	a	haida
<i>Feb. 3d.</i> —	Ouer	faerda	we	ad	a	erven
	<i>Hallowed</i>	<i>be</i>	<i>Thy</i>	<i>name.</i>		
<i>Dec. 20th.</i> —	Howarda	beda	adarda	dene		
<i>Feb. 3d.</i> —	Alloeda	be	Thy	name.		

The author regarded the case as mainly one of defect of articulation, the centres for which might be regarded as less apt for education than those of average individuals.

DR. PYE-SMITH agreed with Dr. Taylor that the term "idioglossia" was not the best one to express the condition, which was not a language but an imperfect form of English, or rather English imperfectly pronounced. He noticed that with labials and gutturals differences well known to philologists were found, as "d" for "l," "g" for "y," etc. The prefixing of vowels was, he said, curious, and compared the French word "espèce" with the Latin "species." The addition of terminals also was well known. They seemed to him to be extreme cases of what was called in America "baby language," complicated, perhaps, in some of the cases by some physical defect, as nasal obstruction.

DR. HADDEN referred to two cases of a similar nature published by him in the *Journal of Mental Science*. He suggested that the best treatment was by isolation. His first case was left-handed, and his father had died in an asylum. He agreed with the previous speakers that the term "idioglossia" was not a satisfactory one.

MR. SPENCER WATSON thought that the cases under discussion might belong to the class of deaf-mutes, and that there might be errors of hearing comparable to errors of refraction, and that the condition could be removed by education. The defects could be attributed partly to defective hearing, partly to imitation, and partly to adenoid growths in the posterior nares. It was not necessary to assume any central nervous defect.

soon gave rise to serious cerebral disturbance, the patient became delirious, then comatose, and death ensued.

Post-mortem examination revealed a growth in the anterior and middle mediastinum, toward the right of the median line, projecting upward into the root of the neck. The mass completely surrounded the superior vena cava and seriously involved the other great venous trunks in the same region. There were nodular projections of the new tissue into the lumen of the superior cava. The growth had not involved the pericardium to any extent, and there was no pericarditis. The tumor was unusually limited and localized, and, although presenting to the naked eye all the features of a cancerous growth, it was found on microscopic examination to be a lympho-sarcoma.

In the discussion, MCCALL ANDERSON said that one of the chief points of interest in connection with this class of cases was the diagnosis. It was frequently one between tumor and aneurism. He believed that one distinguishing feature was pressure upon the veins. This was rarely observed in the case of aneurisms.

HYPERTROPHIC BILIARY CIRRHOSIS.

GHOSH (*Indian Medical Gazette*, January, 1891) read a paper before the Calcutta Medical Society on the distinction between biliary cirrhosis and other painless enlargements of the liver. This particular form of cirrhosis occurred in children under two and a half years of age, and almost invariably terminated fatally in from three to twelve months. It manifested itself by a painless enlargement of the liver, which was hard and resistant on palpation, in consequence of a hyperplasia of the interlobular connective-tissue. The organ, at first enlarged, became subsequently diminished in size, from secondary contraction. In some cases, the spleen was also enlarged. There was fever of a continued type, with evening exacerbations, ascites, jaundice, and death from cholæmia. The only etiological element proposed is faulty diet. The disease is becoming more frequent in India and is not seen in European children. It is to be diagnosticated from amyloid disease and enlargement of the liver due to malaria. It is distinguished from the former by the age at which it occurs, its etiology, its rapid and fatal progress, the absence of anæmia and cachexia, the common occurrence of jaundice, the absence of involvement of kidneys, stomach, and intestines, and the anatomical changes. The diagnosis from the enlarged liver of malaria is more difficult. The principal points of distinction, however, are—race; age; sex, males being affected with the biliary form in largest proportion; locality, biliary cirrhosis not being confined to malarious districts; type of fever; absence of cachexia; prognosis; duration and mortality; etiology; results of treatment.

MERCURIAL STOMATITIS.

FOURNIER (*La Médecine Moderne*, January 15, 1891) discusses the causes and prophylaxis of the stomatitis resulting from the therapeutic administration of mercury. In giving mercury by the mouth, by inunction, by fumigation, or by subcutaneous injection, there is always risk of producing stomatitis. All preparations of mercury, however, are not equally active in

RESEARCHES ON THE EXTREMES OF TEMPERATURE BORNE BY THE LEUCOCYTES OF HUMAN BLOOD.

MAUREL (*Comptes rend. d. Soc. d. Biol.*, 1890, ii. 538) publishes some very interesting researches upon this subject. He describes the different forms of leucocytes found in the blood, as illustrating somewhat their life-history there. He then details the results of his experiments in subjecting blood to different degrees of temperature, watching meanwhile the effect upon the power of motion and upon the life of the white corpuscles. A degree of cold below 16° C. could only be borne by them for a short time, and 14° C. was immediately fatal. On the other hand, a temperature above 44° C. rapidly threatened their life, while one of 47° C., even for a few minutes, suffices to kill them.

From a clinical standpoint these experiments show that the greatest degree of activity of human leucocytes is witnessed at the temperature of the blood in a normal state, or during a febrile state of slight intensity. As is well known, the axillary temperature is about two degrees less than that of the blood in the interior of the body. It is evident, therefore, that in very high fever, with an axillary temperature of 41° C., or, exceptionally, of 42° C., a point is being approached at which the life of the leucocytes is seriously threatened.

A CASE OF MEDIASTINAL TUMOR.

At a meeting of the Glasgow Pathological and Clinical Society (*Glasgow Medical Journal*, February, 1891) GEMMELL reported the case of a laborer, aged sixty, with cough, expectoration, shortness of breath and a sense of suffocation. The urgent symptoms had existed for six weeks. The face was flushed and bloated, the lower eyelids œdematous. Pulse, temperature, and respiratory frequency presented nothing abnormal. Examination of the lungs revealed the signs of chronic bronchitis. There was no œdema of the lower extremities and no ascites. No lesion of the abdominal viscera was detected. The urine was non-albuminous. The progress of the case suggested the presence of an intra-thoracic tumor. A circumscribed area of dulness was detected in the region of the manubrium sterni. In this situation, the second sound of the heart was "highly musical and of deep-toned quality." There was a difference in the force and rhythm of the radial pulses, the left being weaker than the right and somewhat delayed. No abnormal pulsation was perceptible. No enlarged glands were found above the clavicle, to indicate the presence of malignant disease within the thorax. The position of the trachea was median. The veins of the neck were greatly distended. The face was congested, the lips livid. Respiration was accompanied by distinct stertor, inspiratory and expiratory. The voice was hoarse, the cough not brassy. The mucous membrane of the larynx participated in the œdema. The movements of the vocal bands were normal and, except for a slight linear injection, their general appearance was healthy. The trachea appeared not to be compressed. The patient did not complain of pain or of abnormal sensations. The obstruction to the venous circulation

than is the case with women; operation greatly prolonged the duration of life. The disease was generally central—that is, placed below the nipple; preceding eczema was noted in two cases, and very frequently the beginning of the disorder was attributed to traumatism. In 24 per cent. of those questioned on this point cancer existed in the family. Death was due usually to asthenia dependent upon metastatic processes which the autopsy records show to be more frequent among men suffering from malignant disease of the breast than among women.

THE TREATMENT OF STRICTURE OF THE MALE URETHRA.

DR. J. WILLIAM WHITE (*University Medical Magazine*, vol. iii., No. 6, 1891), after giving his views *in extenso* as to the treatment of organic stricture of the male urethra, summarizes them as follows:

1. Strictures of large calibre—that is, of more than No. 15 French, situated at or behind the bulbo-membranous urethra—are to be treated, almost without exception, by gradual dilatation.

2. Strictures of large calibre, occupying the pendulous urethra, are to be treated by gradual dilatation when very recent and soft, and by internal urethrotomy when of longer standing, distinctly fibrous in character, or non-dilatable. It is to be remembered that the great majority of so-called strictures of large calibre of the pendulous urethra are merely points of physiological narrowing.

3. Strictures of the meatus and of the neighborhood of the fossa navicularis should be divided upon the floor of the urethra whenever it is evident that they are real pathological conditions producing definite symptoms, and not normal points of narrowing.

4. Strictures of small calibre (less than No. 15 French) situated in advance of the bulbo-membranous junction, unless seen very early and found to be not usually soft and dilatable, furnish the typical condition for internal urethrotomy, which should be done preferably with a dilating urethrotome, and invariably with all possible antiseptic precautions.

5. Strictures of small calibre (less than No. 15 French) situated at or deeper than the bulbo-membranous junction should be treated, whenever possible, by gradual dilatation. In a case of resilient irritable or traumatic stricture in this region, or of stricture, which, for any reason (as the occurrence of rigors), is non-dilatable, external perineal urethrotomy is the operation of choice.

6. Strictures of the deep urethra permeable only to filiform bougies should be treated by gradual dilatation when possible, the filiform being left *in situ* for some time, and followed by the introduction of others, or used as a guide for a tunnelled catheter. If the stricture be not suitable for dilatation, external perineal urethrotomy should be performed.

7. Impassable strictures of the deep urethra always require the performance of perineal section.

THE TREATMENT OF TUBERCULAR ARTHRITIS BY IODOFORM INJECTIONS.

KRAUSE first employed intra-articular injections in the treatment of tubercular joint disease only in those cases where the pathological process was so

this direction. The protiodide deserves the popularity in which it is held. From one-third to three-quarters of a grain daily is ordinarily well borne. Larger doses are apt to produce ptyalism and stomatitis. The bichloride in doses of one-seventh (!) of a grain, once, twice, or three times a day, is well tolerated. It does not salivate because it must be given in small doses so as not to be rejected by the stomach.

Inunctions are most likely to give rise to stomatitis. A drachm of mercurial ointment, well rubbed into the skin, occasions no unpleasant results. When stomatitis follows inunctions, its onset is sudden and its intensity marked.

In administering mercury by subcutaneous injection, stomatitis may be avoided by using minimal doses at intervals of two or three days.

Certain conditions favor the development of mercurial stomatitis. There may be an idiosyncrasy against mercury in any form, the smallest doses, however administered, causing ptyalism, or the appearance of a red rash. Pre-existing stomatitis, from whatever cause, invites an intensification from the use of mercury. The mere presence of the teeth seems to be sufficient to induce such a condition, as mercurial stomatitis is not seen in edentulous infants and old persons, or in those employed in mercurial mines who have already lost their teeth.

Females are more susceptible than males to the ptyalizing effects of mercury. Salivation also occurs with greater readiness when inunction is practised upon a delicate surface, as the skin of the scrotum, or where an abrasion exists or the epidermis has been removed.

SURGERY.

UNDER THE CHARGE OF

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TUMORS OF THE MALE BREAST.

SCHUCHARDT (*Archiv. f. klin. Chirurgie*, Bd. xli., Heft 1) publishes an elaborate statistical study of tumors of the male breast.

In all, he has collected four hundred and sixty-nine cases. He finds, contrasting the disease as it affects men and women, that 15 per cent. of all tumors involve the breast, and that of these only 1 per cent. is found attacking the male breast.

The average duration of malignant breast tumors was eight months longer

TWO CASES OF RUPTURE OF THE BLADDER.

Under this caption ROSE (*Deutsches Zeitschr. f. Chirurgie*, Bd. xxxi., Heft 2 and 3), in addition to a careful study of the symptomatology of fractures of the pelvis with injury to the urinary tract, contributes the histories of two cases of bladder rupture.

If, after an injury, the urine contains blood, even a small quantity, intimately intermingled with the fluid and not appearing in clots, and if, in addition, there is tenderness in the region of the kidney, the diagnosis of rupture of the kidney may be made safely. If there is retention of urine with a flow of blood from the meatus, it is quite certain that the urethra is ruptured.

Both kidneys and urethra are much more frequently ruptured than is the bladder. When the latter viscus is involved, anuria and blood on catheterism are the most characteristic signs. In the first reported case, two days after severe traumatism to the pelvis, laparotomy was performed, although the patient was nræmic and suffering from purulent peritonitis and beginning infiltration; a long rip of the bladder was found. The infiltrated urine was washed out, drainage was employed, and the external wound and the suppurating extra-peritoneal sac was packed with iodoform gauze, and the bladder was drained by a permanent catheterization. The patient recovered.

The second case suffered from an extra-peritoneal rupture of the bladder. The operation was performed the second day after the injury. The wound was treated by the open method, and though six months were required to accomplish this result the patient finally recovered.

 THE TREATMENT OF COMPLETE PROLAPSE OF THE RECTUM.

HARRISON CRIPPS (*Lancet*, vol. ii., No. 15, 1890), while granting that complete excision may at times be necessary for the cure of complete prolapse of the rectum, holds that the risks involved in the operation, and the probability of causing subsequent stricture, should lead the surgeon to leave this as a last resort.

In linear cautery he believes that we have an alternative operation founded upon sound physiological principles and attended with very slight risk.

Since prolapse is due to the slipping of one coat of the bowel on the other, together with want of sufficient rigidity in its walls to prevent invagination, the binding the muscular and mucous coats together, and at the same time stiffening the walls by inflammatory deposit, would seem to be plainly indicated. An exudation artificially produced in the submucous tissue meets this indication by cementing the coats firmly together, thus effectually preventing slipping, and at the same time giving the bowel sufficient rigidity. The actual cautery is admirably fitted to produce an abundant inflammatory exudate. Before performing the operation the bowels should be thoroughly emptied. The patient should be anæsthetized and placed in lithotomy position. If possible, the prolapse should be made to protrude; four lines of cautery are then drawn along the bowel in its long axis. These lines should begin well within the canal of the bowel at the apex of the protrusion and terminate at the anal margin; they should be about one-quarter of an inch in width, and deep enough to thoroughly scar but not actually destroy the

far advanced that surgical interference offered the only chance of betterment. Results, even in the suppurative cases, were so satisfactory that the treatment was applied to less severe cases, not excepting those in the incipient stages of arthritis, in the hope that not only might the disease be arrested, but that the function of the joint might be preserved.

Within the last ten years (*Archiv. f. klin. Chirurgie*, Bd. xli., Heft 1) many tubercular knee- and hip-joints, and a few of the ankle, wrist, and elbow, were subjected to the iodoform treatment. Cure was accomplished in a large percentage of the cases, the results being especially satisfactory in cases presenting disease of the knee or wrist. There were also a few instances where the disease proved obdurate; thus an amputation became necessary in one case, in another tubercular meningitis developed four weeks after the evacuation and injection of the iodoform.

In some instances of advanced wrist-joint disease, associated with discharging sinuses and pulmonary disease, where excision or amputation seemed the only resort, the injections proved most satisfactory. A cure took place with movable and useful fingers, though the diseased joint became firmly ankylosed. Some almost incredible cures of knee-joint disease are fully reported.

Aside from the admirable results which this treatment yields, it possesses the advantage of being readily applied, and of requiring only the subsequent care and attention called for by a minor surgical operation.

When abscesses are formed, either intra- or extra-articular, these are evacuated by means of a large abdominal trocar thrust through the skin drawn to one side, so that, on removal of the instrument, the opening may be valvular. The pus is drained away, all detritus is washed out by a 3 per cent. boric acid solution, and the abscess cavity is moderately filled by injecting a 10 per cent. mixture of iodoform in glycerin. The trocar wound is closed by an antiseptic compress, and moderate pressure is applied to the diseased part. From four to ten drachms of the iodoform mixture may be injected at one time. Incision is sometimes necessary when the discharge will not flow through the canula. When there is no abscess cavity a very small canula should be employed to carry the medicament to the diseased tissues. A comparatively small amount need be injected in children, a drachm and a half frequently proving sufficient. In whatever condition the joint may be, it is vigorously manipulated immediately after the injection for the purpose of thoroughly distributing the iodoform throughout the diseased area.

The wrist-joint is best reached by thrusting in the trocar just below the styloid processes of the radius and ulna; to enter the elbow-joint it may be thrust in immediately above the head of the radius, which can be felt readily on pronating and supinating the arm; the shoulder-joint is most accessible, either external to the coracoid process, or external to the scapular spine as it merges into the acromion process; to reach the hip-joint a three-inch trocar is required, this is entered just above the trochanter major, the leg being adducted and inverted, and is carried slightly forward until it strikes the head of the bone, when in forcible adduction it may be carried into the joint. A puncture beneath the patella will reach the knee-joint; the ankle-joint may be penetrated by thrusting in the trocar immediately below the malleoli and then turning its point upward and introducing it still further.

This is not the only case in medical literature in which acute meningitis has been caused by the pneumococcus, although the patient was not at the time suffering from pneumonia. It would, then, seem imperative to practise, as a prophylactic measure, most careful disinfection of the nasal cavities in cases of wounds of the base of the skull where such injury may directly or indirectly communicate with these cavities. Since injection under pressure may be the means of forcing septic germs into uninfected areas, Fränkel advises recourse to careful iodoform-gauze tamponade.

A MODIFIED SUTURE FOR INTESTINAL ANASTOMOSIS.

SACHS (*Centralblatt für Chir.*, No. 39, 1890, p. 737), after referring to the various methods now in use, explains his modification of Senn's bone-plate method. Instead of two plates he uses one piece of bone, which he compares to a cuff-button with a hole through it. It more nearly resembles a pulley-wheel.

At the desired place for anastomosis the lateral surfaces of the intestinal loops are approximated by suturing serous membrane to serous membrane. A longitudinal incision is then made into each section of gut parallel to the line of suture. The bone button is then slipped in so that the line of suture with the two internal incised edges fits in the groove. The outside edges will fall into place in the other side of the groove, and a few stitches approximating serous surfaces will be found sufficient to retain the parts firmly.

The advantages claimed for this method are:

1. The intestinal lumen is not kept open long.
2. The line of incision is protected from infection by the internal ring—which also prevents closing of the incision.
3. Compression of the intestinal edges is prevented.
4. The sutures do not penetrate the whole thickness of the intestine.

The author has only used this method upon guinea-pigs. The buttons are made of decalcified beef-bone.

GUNSHOT WOUND OF THE ABDOMEN.

Two cases of gunshot wound of the abdomen are reported by T. W. HUNTINGTON and G. A. WHITE (*Occidental Medical Times*, vol. iv., No. 12, p. 636).

The men were middle-aged whites who were shot in an affray near Sacramento. The ball was of 38-calibre in each case. They received medical attention five hours after the injury.

In the first case the ball entered the left hip at a point three inches below the crest of the ilium and four inches posterior to the anterior superior spine. Thence it passed inward, upward, and forward, and was located beneath the skin at a point one-half inch above and one inch to the right of the umbilicus. Laparotomy was performed, and six perforating wounds of the gastro-intestinal tract were discovered: one in the anterior wall of the stomach near the great curvature, and the others in the small intestine. The wounds were closed with continuous catgut sutures for the muscular and mucous coats, and interrupted Lembert sutures for the peritoneal coat. A small quantity of blood—no feces—was washed from the peritoneum with

mucous coat. Where the cautery lines cross large veins these should be tied on each side by passing a threaded needle beneath and knotting. If much time is spent in the operation swelling will take place and the reduction will be difficult.

In case the prolapse cannot be made to protrude, the bowel may be cauterized *in situ* by using the duck-bill speculum, which may be shifted when necessary. The actual cautery is most satisfactory, since Paquelin's instrument is too hot when first applied and loses heat too readily. After operation a thick India-rubber tube one-third of an inch in calibre and seven inches in length is passed into the bowel for five inches. Strips of oiled lint are then packed around the tube, extending as far as possible into the bowel. Cotton-wool well dusted with iodoform is finally packed into the tube and in and about the anus; thus firm support is given and at the same time the escape of flatus is not prevented.

Special care must be taken to prevent the descent of the bowel during the early stages of healing. In forty-eight hours the first dressing is removed, the parts are washed, and a clean dressing is applied. After the first few days the dressing can be dispensed with, but the tube is retained for ten days. During this time the bowels should be kept locked by small doses of opium. Evacuation is finally accomplished by means of castor oil and enemata. The patient must not be allowed to strain, and must empty the bowel while lying on his side with the anus drawn a little from the middle line. This should be enforced for at least six weeks, during which time consolidation is taking place.

THE ETIOLOGY OF SECONDARY INFECTION IN WOUNDS AT THE BASE OF THE SKULL.

It is a well-known fact that after gunshot wounds involving deeper organs the patient may for a long time exhibit no unfavorable symptoms. The external wound in the meantime heals promptly, and yet, after a lapse of time, and frequently with great suddenness, symptoms of septic absorption may develop. These symptoms are usually inaugurated by a violent chill, after which are developed the characteristic features of local and general infection.

In this relation an interesting case is communicated by FRÄNKEL (*Wien. klin. Woch.*, 3te Jahrg., No. 44). The patient, aged thirty-two, shot himself with a twenty-two calibre revolver in the left temporal region. The probe showed that the wound was a penetrating one. There were no brain symptoms, the external wound closed promptly after antiseptic dressing, and in twenty-one days the patient seemed completely well, having left his bed. At this time he was suddenly attacked with a severe chill followed by headache and high fever; death ensued in five days. Autopsy showed that the bullet had passed inward between the dura mater and the supra-orbital plate of the frontal bone, fracturing and comminuting the latter. When this fractured bone was chiselled out there was found, immediately beneath, a collection of thick, mucous, brownish fluid. Cultures from this, from various parts of the intensely injected brain, from the fluid in the ventricles, and from the blood in other parts of the body, showed that it was a case of septic infection from the *diplococcus pneumoniae*.

destroyed. The nerve-trunk is then partially divided at the scar in a vertical direction to its axis. The nerve is then split to within one-third of an inch of its end, and the flap thus formed is thrown over across the gap, and is sutured to the other divided end of the nerve. The author has not performed this operation, but presents it for trial in suitable cases.

TUBERCULOUS KIDNEY.

A case of tuberculous kidney is communicated by LECLERQ and TOURNIER (*Lyon Médical*, an lxx., 22). The diagnosis was a matter of some difficulty. The sign to which Mollière has attached some importance, namely, the absence of copaliba odor in the urine when that drug is administered, directed attention to the kidneys. Polyuria, acid reaction, together with abundance of pus, pain in the right lumbar region, progressive cachexia, and fever, pointed strongly to the probability of a tuberculous involvement of the kidney. Careful search of the urine was made for the bacilli, but this examination was negative. But slight pulmonary lesions could be found.

The autopsy showed slight tuberculous involvement of the lungs, miliary tubercles of the left kidney, and the transformation of the right kidney into a purulent sac containing several ounces of pus.

A SECTIONAL SPLINT.

DR. F. BIERHOFF (*Med. Record*, vol. xxxviii., No. 19, 1890, p. 518) has designed a sectional splint for use in the treatment of fractures on the field, or in country practice where a long splint is poorly adapted for transportation and not always obtainable.

The splint consists of five pieces of light, strong wood, each piece being eighteen inches long by three wide, and three-eighths of an inch thick. On the sides of the pieces are grooves or depressions for binding the portions together. The depressed portions are one and one-half inches in length and three-sixteenths of an inch in depth, three inches apart, and one and one-half inches from either end, so that, with the sections in position, all are three inches apart.

A METHOD OF APPLYING PLASTER JACKETS WITHOUT THE SAYRE SUSPENSION APPARATUS.

DR. N. E. FOREST (*Med. Record*, vol. xxxviii., No. 19, 1890, p. 519) offers a new apparatus for use in applying the plaster jacket. It consists of a wooden frame two and one-half feet wide by six feet long. At the upper end of the frame is a crossbar by which the child can hold. To apply the dressing, a piece of unbleached muslin is stretched across the frame, which is placed in an inclined position, the head being elevated while the foot is on the floor.

The child is placed upon the muslin, with the arms extended and grasping the head-bar. Traction can be made on the feet if necessary. A triangular opening is made in the muslin on each side of the child, so that a strip is left supporting the back. The plaster bandage is then applied, being passed through the triangular openings, outside the strip of muslin, thus incorporating it between the shirt and the plaster.

plain warm water, and the abdomen was closed without drainage. Duration of operation two hours and fifteen minutes. The convalescence was uninterrupted.

In the second case the ball entered the abdomen midway between the umbilicus and the symphysis pubis. It passed diagonally to the right, through the right ilium, and was found buried in the gluteal muscles two inches below the crest of the ilium, and five inches below and posterior to the anterior superior spinous process. Expectant treatment was followed in this case. The man had violent peritonitis accompanied by uncontrollable vomiting and singultus which lasted for ten days. He finally recovered, with a discharging sinus in the hip. There were no certain signs of intestinal perforation in the latter case.

OPERATION FOR TUMORS OF THE INTESTINE.

In a paper upon this subject (*Archiv für klin. Chir.*, Band xl., Heft 4, S. 905) KÖNIG gives the results of operation in thirteen cases of tumor of the intestine.

In three of these cases the laparotomy was nearly exploratory, as it was found that removal of the tumor was impossible on account of adhesion to surrounding structures, and no obstructive pressure was exerted upon the intestinal tract. In three other cases, although the tumor was found impossible to remove, yet it was necessary to make an artificial anus on account of the stenosis which had resulted.

Of these six cases, one died as a result of the operation, in six days, of peritonitis. Two were still living. One died six weeks after the operation, of marasmus. One was dying at the end of four weeks, and one succumbed to carcinoma at the end of three months.

In the other seven cases radical operations were performed. In five of these cases the intestine was resected and the divided ends brought together; in two an artificial anus was formed after resection.

Of these patients four died as a result of operation. Three died out of the five in whom resection and suture of the intestine was performed; and one died of those in whom an artificial anus was made after resection. The second patient—with an artificial anus—died of recurrence one year after operation.

Of the two patients who survived the operation of resection and suture, both are still living, one three years after removal of a carcinoma of the ileum, and the other six months after removal of tuberculous intestine.

In one case, which made in all fourteen that were submitted to operation, the diagnosis of tumor of the intestine was not confirmed by laparotomy. The thickened flexure of the colon, bound down by a band of adhesion, had presented the appearance, and been mistaken for, carcinoma. The patient was cured by removal of the adhesion.

A NEUROPLASTIC OPERATION.

H. H. A. BEACH (*Boston Med. and Surg. Journal*, vol. xxiii., No. 24, p. 562) describes a new operation designed for the restoration of nerve-trunks which have been destroyed by injury or disease. The nerve-sheath is opened in either direction for a distance somewhat greater than the length of nerve

it quiet, it is impossible in the case of the stapes, however, to observe immobility, as it is called into action by every sound.

The form of inflammation observed in this case is not developed from serous, mucous, or purulent inflammations in the middle ear, but from almost unknown causes; sometimes from hereditary influences, in the second or third decennium of life. It generally begins with light subjective noises, which gradually increase, and may continue for months or years without any decrease in hearing. Hence these noises are often mis-called "nervous," and erroneously referred to hyperæmia, or anæmia of the brain. In a normal stapes the inner surface of the foot-plate, as well as its edges, are covered with hyaline cartilage. The same is found around the edges of the oval window. The foot-plate of the stapes does not fill up the entire space in the oval window, but between it and the circumference of the oval window is found the so-called annular ligament, constituting a symphysis. In this ligament occur, according to Katz, and as shown in his specimens, the first inflammatory processes of progressive hardness of hearing. From this it extends to the cartilage, and then the bone. In this case the foot-plate was increased to four times its usual size, and formed with the adjoining bone of the oval window and annular ligament a uniform mass, in which only a faint trace of the joint could be detected. The cochlea was normal, Corti's organ intact, and the auditory ossicles free from disease, as were also the intrinsic muscles of the middle ear. The affection was the same on both sides.

Concerning treatment of this ankylosis it is stated that only surgical measures will avail. Notwithstanding the recommendation of some to remove the stapes, Katz regards the operation as difficult and dangerous. Difficult it certainly is, but it has not been shown to be dangerous; rather the reverse by Kessel's operations. Bromide of potash has little effect, and inflations of the tympana none. Better results are obtainable by rarefaction of the air in the external ear, which acts like a dry cup on the membrana tympani and its adjuncts.

As the affection is primarily rheumatic, according to Katz, he recommends at the outset small doses of salicylate of soda and antipyrine.

THE JUGULAR FOSSA AND DEFICIENCIES IN THE BONY FLOOR OF THE TYMPANIC CAVITY.

DR. OTTO KÖRNER, of Frankfurt-on-the-Main, draws attention to this important subject, and adds to our knowledge concerning it. (*Archiv für Ohrenheilkunde*, vol. xxx., 1890). Numerous observers have called attention to these dehiscences in the partition between the drum-cavity and the jugular fossa. They are probably congenital, but may occasionally be due to erosion from congestion in the jugular vein. They demand consideration, because, by their existence, the mucous membrane of the tympanic cavity is in direct contact with the jugular vein, and in such a case a disease of the mucous membrane may spread to the wall of the bloodvessel, and induce hæmorrhage or pyæmia. Furthermore, in such an instance paracentesis of the membrana tympani may also incise the bulb of the jugular projecting into the tympanic cavity, as has been reported.¹

¹ *Archiv für Ohrenheilkunde*, vol. xxix. p. 234.

OTOLOGY.

 UNDER THE CHARGE OF

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 OPERATION FOR CORRECTING DEFORMITY DUE TO PROMINENT EARS.

DR. GEORGE H. MONKS has considered various methods of rectifying the deformity of prominent ears, and has decided that a surgical operation involving merely the skin on the back of the auricle affords the surest and greatest relief (*Boston Medical and Surgical Reporter*, December 22, 1890). Operations including both skin and cartilage are called for, in his opinion, only where the cartilage is stiff, and hence are applicable principally in adults.

When the excision of cartilage does not seem to be necessary, excision of the skin alone will correct the deformity. "The shape of the ellipse of skin to be removed from the back of the ear will vary, to a certain extent, with each case. Undue prominence of the ear at any one point should call for resection of a specially broad piece of skin at that point. . . . In all cases the inner incision should be close to the bottom of the sulcus, where the skin of the back of the ear joins that on the side of the head." The edges of the incision made by the removal of the ellipse of skin are to be brought together by six or seven stitches of silk or catgut, the wound treated antiseptically, and the auricle forced against the head. A bandage should be worn for a period of ten days or two weeks, and at night for several months a bandage or a nightcap should be worn to prevent dragging on the cicatrix by the patient when turning in his sleep.

 OSSEOUS ANKYLOSIS OF THE STAPES IN CHRONIC DRY CATARRH OF THE MIDDLE EAR.

DR. L. KATZ, of Berlin, presented several microscopic specimens from the ear of a woman, thirty-nine years old, who had become deaf from a so-called dry catarrh of the middle ear, or, more properly expressed, from a chronic interstitial inflammation of the foot-plate of the stirrup bone and its environs at the oval window (*Deutsche med. Wochenschrift*, October 2, 1890). Hearing was reduced to loud words spoken directly into the ear. The membranæ were nearly normal in appearance, presenting nothing to account for the deafness. It further appears that the deafness had been progressive for thirteen years, and the patient had been long annoyed by roaring in her ears, like the sound of rushing water. Her father became deaf at the age of sixty years, but her brothers and sisters possessed normal hearing; she had never been syphilitic. The disease of the stapes in the oval window in this case was considered by Katz to be due to an arthritis of a rheumatic nature. While such an inflammation in any larger joint is usually treated with success by keeping

1. Impulses originating in the temporal lobe or superior temporal gyrus, the cerebellum, or the auditory nuclei (in the medulla or pons), and referred as impressions to various situations—as the labyrinth or certain parts of the head. Such acoustic impressions may or may not be attended by deafness.

2. Impulses due to irritation, direct or reflected, in any portion of the auditory nerve.

3. Impulses originating in the peripheral ends of the auditory nerve (perhaps the most numerous class).

4. Irritation arising from interference with the intra-tympanic muscles.

5. Irritations transmitted by altered conditions of equilibrium of the air in the tympanic cavity.

6. Irritations due to disease in the middle ear and labyrinth.

7. Irritations arising in the external ear.

8. Some aural hallucinations, subjective impressions arising in the psychosensorial brain-centres, and having no objective cerebral or aural source of origin. Such hallucinations may become insane hallucinations. The latter may be divided into two distinct forms: (a) Hallucinations which arise subjectively in the brain when the auditory apparatus and nerves are healthy. (b) Hallucinations which are secondary to objective changes in the aural apparatus, and in which a tinnitus is developed that leads up gradually to a fixed illusion.

9. Therapeutical causes of tinnitus aurium.

ABSCESS OF THE MIDDLE EAR.

DR. ROBERT BARCLAY (*St. Louis Medical and Surgical Journal*, January, 1891) presents a most important and practical paper on the above-named subject. After a graphic description of the suffering caused by inflammation in various parts of the drum-cavity, he concludes as follows: "In abscess of the middle ear, operation on the drum-head for the release of pent-up secretions being indicated, if the nidus of the abscess is in the malleo-incudal niche of the attic of the tympanum, cut freely to it through the membrana flaccida; if in the atrium also, or alone, operate as well, or only, upon the membrana vibrans, at whatever spot thereof bulges most; or, if its bulging be uniform, operate at the posterior-inferior quadrant."

SOME REMARKS ON THE EARLY TREATMENT OF OTITIS.

DR. SAMUEL SEXTON, under the above title, addresses to the editor of the *New York Medical Record* (February 7, 1891) some timely suggestions as to the early management of cases of acute inflammation in the attic region, especially in children. As the invasion of the disease is rapid, so the remedy should be sure and swift: no stabbing the drum-head in the dark, or fruitless incision into the canal. If the patient is a child have it narcotized, and then examine the ear carefully, under illumination with the electric head-lamp, worn on the forehead of the surgeon. Do not wait for days for spontaneous rupture, while injury may be done to deeper parts by extension of the inflammation, but, with the patient etherized if a child or nervous adult, make an incision with a slender but strong paracentesis-knife through

Probably phlebitis and thrombosis of the jugular occur more frequently than might be supposed from the few cases reported, through disease of a very thin dividing wall between the drum-cavity and jugular fossa, or directly through dehiscences in the bone.

It has long been known that the jugular fossæ on both sides of the same skull vary greatly in size and depth. These variations are induced by the varying size of the two jugulars. The investigations of Bezold, Rüdinger, Von Meyer, and Körner, show that in the majority of skulls the right transverse sinus is larger than the left. Rüdinger has shown that the right jugular fossa is, on the average, larger and deeper than the left. When this is the case, the osseous wall separating it from the drum-cavity is thinner and often perforated.

ON THE ETIOLOGY OF TINNITUS AURIUM.

DR. H. MACNAUGHTON JONES read a paper on the subject named above in the Section of Otology, British Medical Association, 1890. (Reported in *Medical Press and Circular*.)

The paper is based upon two hundred and sixty cases of tinnitus aurium, taken from the author's private note-book. Of these, 127 were males, and 133 females. The ages varied from under ten years (3) to eighty years. The youngest patient was three years old. The right ear was the seat of tinnitus 36 times, the left ear 53 times, and both ears 171 times. - The ascribed causes were cerumen, 30; naso-pharyngeal catarrh, 28; nasal turbinate congestion and obstruction, 19; mental worry and over-strain, 14; sea-bathing, 12; scarlatina, 9; heredity, 8; effects of tropical climate, 8; the menopause, 8, injuries, 7; hypertrophied tonsils and tonsillitis, 7; abscess or inflammation of meatus, 7; cardiac disease, 7; gout, 5; uterine disorders, 5; measles, 4; syphilis, 4; alcohol, 4; rheumatic fever and rheumatism, 3; pregnancy, 2; Bright's disease, 2; ozæna, 2; decayed teeth, 2; facial paralysis, 1; puerperal septicæmia, 1; quinine, 1; adenoid growths, 1; from gun-concussion, 1; pneumonia, 1; parotitis, 1. In the remaining cases no cause was assigned.

The clinical conditions of the ear found in these cases were chiefly: catarrhal changes in the tympanum, 102; the same with closed Eustachian tube, 38; making really 140 cases of associated tympanic disease.

The hearing distance was normal in both ears in 18 cases. In 185 cases tinnitus and deafness alone were complained of; in 22 cases aural vertigo was also present. In 7 cases only were there any accompanying ocular symptoms. Attention is called to Ferrier's statement, that "the sense of hearing is in greater part situated in the temporal lobe, and more especially in the superior temporal gyrus of this lobe." Dr. Ferrier also is quoted as saying that "tinnitus may occur in both ears as the result of unilateral irritation, the effect of the intimate connection of the auditory nerves and centres."

Very slight causes may underlie tinnitus aurium, as for example: "A fine membranous husk of a hay-seed resting on the membrana tympani."

The following is a basis for a classification of the different causes and varieties of tinnitus aurium, condensed from the original:

the apparent onset of the disease, the decline seeming to have been very rapid. Tracheotomy, about fourteen hours before death, failed to relieve the fatal dyspnoea. The case is described in detail, and the histological appearances still more minutely. Considerable consideration has been given to the differential diagnosis between leprosy, lupus, tuberculosis, syphilis, rhinoscleroma, glanders, traumatism, and non-specific inflammations. An excellent bibliography is appended of authorities consulted in studying the case. The result arrived at is that the case must be considered as one of chronic localized tuberculosis, probably a form analogous to sclerous lupus; an opinion indorsed by the very able committee (Butlin, Cheyne, Kidd) appointed by the Society to examine into the case.

DIFFUSE PEMPHIGUS INVOLVING NASAL, ORAL, PHARYNGEAL, LARYNGEAL, TRACHEAL, AND CONJUNCTIVAL MUCOUS MEMBRANE.

DR. LANDGRAF reports in detail (*Berl. klin. Wochenschr.*, January 5, 1891) an interesting case in a man forty-eight years of age. In the spring of 1887, while a workman in tar products in a manufactory of chemicals, he began to suffer with burning sensations in his feet and pains in the brow and the eyes. Soon after, the nose began to be painful and to discharge a bloody secretion and bloody scabs; and at the same time a sensation of dryness of the pharynx came on despite copious salivation. Ticklings took place in the larynx as if something were lodged there, and often produced gagging. Dimness of vision in the right eye began at the end of the year, and in the left eye the month following.

Treatment had been unsuccessful up to date of entrance in the Charité Hospital, May 26, 1888. The patient appeared prematurely aged. Internal organs and the sensorium intact. No exanthem. No glandular swelling. He complains of bilateral difficulty of vision and of trouble in the nose and throat.

The conjunctiva of both eyes is shrivelled and its two surfaces adherent for a great distance, leaving but narrow slits for vision, through which the cornea is seen to be turbid and covered with newly-formed bloodvessels.

The nasal mucous membrane is covered with adherent scabs; and after removal of the scabs is found to be atrophic. The septum narium is perforated, and the edges of the orifice are slightly ulcerated. The anterior portion of the left lower turbinate bone is carious. The soft palate is adherent to the posterior wall of the pharynx by strand-like adhesions.

The pale mucous membrane of the pharynx and the mucous membrane of the larynx, and at least part of the trachea was covered with circumscribed moss-like patches of whitish-gray deposit, which, when removed, was shown to be composed in part of unchanged epithelial cells, and in part of undifferentiated detritus. The exposed mucous membrane was much congested and bled readily. Despite treatment, up to the spring of 1889, the condition grew worse. Vision steadily diminished. No changes took place in the nose. The process progressed gradually in the pharynx and larynx, the shedding of epithelial layers continuing in masses of greater or smaller, but circumscribed, surfaces. The mucous membrane of the interior of the larynx became thicker, and the passage gradually smaller. The epiglottis increased

the membrana flaccida well into the attic. Immediate relief follows the liberation of the pent-up secretions. If the operation is done promptly, usually no further treatment is necessary.

IMPLICATION OF THE MASTOID CELLS OF BOTH EARS IN A CASE OF
CHRONIC PURULENT OTITIS MEDIA.

DR. HUNTINGDON RICHARDS has observed a case of the above nature, and has reported "complete and rapid recovery following operation" on the mastoids (*New York Medical Journal*, January 17, 1891). The chronic purulent disease had lasted many years in both ears as a sequel of scarlatina. The patient, a man, thirty years old, of exceptionally strong constitution, had long shown great indifference to an endurance of severe attacks of pain in his ears, but at last the severity of his symptoms induced him to submit to operation; first upon one, and then upon the other, ear. Not only the sufferings of the patient, but the chronic discharge, was relieved, and the hearing greatly improved by the operations.

DISEASES OF THE LARYNX AND CONTIGUOUS
STRUCTURES.

UNDER THE CHARGE OF

J. SOLIS-COHEN, M.D.,
OF PHILADELPHIA.

PERFORATION OF THE ŒSOPHAGUS IN EMPYEMA.

DR. A. F. VOELCKER reports (*The Medical Press*, December 17, 1890) an instance of neglected empyema in a boy six years of age, in whom, some weeks after the operation, fluids that were swallowed escaped through the artificial opening which had been established for the relief of the empyema. The autopsy revealed erosion of the fifth and sixth ribs near their heads, of the ninth rib, and of the sides of the bodies of the fifth and sixth dorsal vertebræ. There were two openings in the œsophagus opposite the eighth and ninth dorsal vertebræ, the lower one just above the diaphragm, the upper one about three-quarters of an inch higher up.

CHRONIC TUBERCULOSIS (? SCLEROUS LUPUS WITHOUT EXTERNAL MANIFESTATIONS) OF THE NOSE, TONSILS, TRACHEA, AND MAIN BRONCHI,
PRODUCING STENOSIS OF THE TRACHEA AND BRONCHI.

DR. THOMAS WHIPHAM and MR. SHERIDAN DELÉPINE report (*Trans. Clinical Society*, London, 1890) an interesting case of extensive localized tuberculous lesions in a boy fourteen years of age. Death ensued within six weeks after he came under their professional observation, nine months after

Chiari, of Vienna (*Wien. klin. Wochenschr.*, No. 41, 1890), has seen the disease produced from chronic irritation of various origin: abuse of spirituous drinks, chronic catarrh, tuberculosis, and syphilis. He has examined several larynges microscopically, in diffuse cases involving the inter-arytenoid region chiefly, and has found the epithelial layer thickened in some instances to five or six times its normal dimensions. He believes that the anterior surface of the inter-arytenoid fold is specially liable to diffuse pachydermia laryngis.

THE PART PLAYED BY MICROBES IN THE DEVELOPMENT AND SPONTANEOUS DETACHMENT OF LARYNGEAL MYXOMATA.

DR. EDWARD BOINET, of Montpellier, reports (*Annales des Mal. de l'Oreille*, etc., 1890) an instance of the rapid development and the spontaneous consecutive expulsion of three large supra-glottic myxomatous polypi from the larynx of an agriculturist, forty-four years of age. Examined histologically by Prof. Kiener, they were found in an advanced stage of necrosis, and filled with three species of microorganisms, which are described in detail; a special elongated bacillus being particularly noticeable in the region of implantation and the zone immediately adjacent, and to the special action to which the detachment of the polyps was attributed.

LARYNGECTOMY.

PROF. BARDENHEUER, of Cologne, reports (*Deutsche med. Wochenschrift*, 1890) that, of his first five cases, four died within eight to fourteen days in consequence of inefficient antisepsis. Of four subsequent cases, three total and one partial, all recovered from the operation, although one died six weeks after operation and three weeks after recovery therefrom, in consequence of extensive bronchial blennorrhœa which had existed previous to operation.

DR. ALEXANDER TIETZE publishes (*Berliner klin. Wochenschrift*, 1890) a short report of twelve extirpations of the larynx in the Königlichen chirurgischen Klinik, of Breslau. The twelve operations were performed on ten patients, and between the years 1879-1890. There were four cases of total extirpation. Two of these had been preceded by partial extirpation. Two of the patients were females. Nine cases were carcinomas; one was a sarcoma. The carcinomas were located in the epiglottis and entrance of the larynx in two cases; in the posterior wall of the larynx in one; in the left half of the larynx in two, and in the right half in four. The sarcoma was located in and above the vocal band of the right side.

Of the four total extirpations, one, a case of recurrence after partial laryngectomy, terminated fatally within three weeks. One lived four years and a half, four years without recurrence, and had been reported cured in the statistical record of Wassermann. One patient died of recurrence one year after operation. One died six months after operation and eleven months after a partial laryngectomy, by reason of a recurrence eroding the innominate artery.

Of the eight cases of partial extirpation, four died within fourteen days—three of putrid bronchitis and one of peritonitis of undetermined cause.

in bulk, and the vocal bands became adherent anteriorly. Finally, the swelling of the epiglottis became so extensive as to preclude further accurate observations. Despite the progress of the process, only very evanescent slight pains were endured until the beginning of winter, when the process began to extend over the mucous membrane of the mouth.

The disease in this case is regarded as pemphigus, despite the failure to notice any characteristic bulla. The chronic process began with patchy desquamation of the epithelium in the uppermost layers of the mucous membrane, and then gradually extended more deeply into the mucous membrane and into the underlying tissues. In some places, as in the nose, the result was atrophy; in others, as in the conjunctiva and pharynx, the result was shrivelling and adhesions of opposing surfaces; in others, again, as in the epiglottis and the laryngeal entrance, thickening of the mucous membrane. Furthermore, the septum narium underwent perforation, and the lower turbinate body became carious.

HOARSENESS.

In an excellent article on hoarseness in professional singers (*Journ. Amer. Med. Assoc.*, 1890), Dr. SAJOUS, of Philadelphia, calls attention, among other better-known conditions, to a deficiency in the lubrication of the vocal bands, which he successfully combats by the use, every two hours, of a warm spray of a saturated solution of potassium chloride, and the administration of ten grains of ammonium chloride in a tumblerful of water at the same intervals. The last dose is taken at least three hours before a performance to avoid exposure during the subsequent stage of perspiration. Between acts he finds a lozenge containing two grains of the drug to be beneficial in some instances.

TUBERCULOSIS OF THE LARYNX.

SCHEINMANN (*Wien. med. Wochenschr.*, No. 35, 1890) applies pyoktanin to tuberculous ulcers by means of a heated probe dipped in the finely-powdered drug; cicatrization is secured without irritation after eight to ten applications.

PACHYDERMIA LARYNGIS.

Eleven cases are reported (*Deutsche med. Wochenschr.*, 1890) by Dr. EDMUND MEYER, of Berlin, all in males, one twenty-seven years of age and the others varying from forty to fifty, and all implicating the posterior portion of the vocal bands. In seven of these cases impaired abduction of the vocal bands was marked, so much so in some of them as to produce severe dyspnoea on account of the median position of the vocal bands. All were benefited by the internal administration of potassium iodide, though in none of them does it appear that the little tumefactions underwent complete resorption. Meyer states that he has never seen a case in association with syphilis or tuberculosis, and he expresses doubts as to any such association.

There has been abundant evidence, however, that the chronic inflammation accompanying tuberculosis and syphilis, and the inflammatory processes immediately surrounding malignant and even benign growths, does at times result in producing this dermoidal transformation. Thus, Dr. O.

more recent observations of others have more than confirmed. But concerning lupus erythematosus, the author's experience, embracing anatomical, bacteriological, and experimental researches, compels him to express the opinion that its tuberculous nature is far from being demonstrated. As is well known, for some dermatologists lupus erythematosus is of a serofulo-tuberculous nature, while for others it is an affection distinct from lupus vulgaris. In lupus erythematosus there exists diffuse infiltration of the derma, especially localized in the upper strata. The infiltration consists of a great number of embryonal cells, grouped especially along the vessels, and nowhere in nodules as in lupus vulgaris. The hair follicles are generally enormously dilated in the first stage of the disease. The excretory ducts of the sudoriparous glands are invaded by infiltration and show granular fatty degeneration. The lesions of the epidermis are dry, and for the most part atrophic. There is no pathological analogy between the two diseases, as the author has pointed out in his numerous publications on the subject during the past seven years. He has never been able to find the least sign of the bacillus of tuberculosis in lupus erythematosus; and he adds that he knows of no dermatologist who has been more fortunate in his investigations. Experimental tests with inoculation in lupus erythematosus have also failed. Attention is called to the fact that lupus vulgaris in certain cases, where the nodules are confluent, superficial, congested, and seated in the papillary layer, may closely simulate lupus erythematosus. The work is illustrated with colored plates of the minute anatomy of the disease.

MOLLIN AS A BASE FOR OINTMENTS.

JULIUS KÜHN (*Berliner klin. Wochenschrift*, 1890) directs attention again to the preparation made by Th. Canz, apothecary, of Leipzig, known as mollin, and recommends it as a base for ointments. The preparation was introduced a few years ago, and Kühn's recent experience leads him to regard it as valuable. Mollin is a 17 per cent. over-fatted soap, and as a base for ointments possesses many advantages over lard and the petroleum products in the treatment of many skin diseases, especially those running a subacute or chronic course, such as seborrhœa, acne, psoriasis, and scabies. On account of its soapy nature, it should not be employed in the acute inflammations. Some of the numerous advantages claimed for it by the author are that it is a clean remedy and can be easily removed. It keeps well for years, even in hot climates, and it mixes intimately with the various medicaments in common use, such as mercury, chrysarobin, sulphur, tar, resorcin, salicylic acid, etc. Rapid cures of psoriasis, acne, and other diseases are reported.

CONCLUSIONS OF THE COMMITTEE OF PHYSICIANS OF THE ST. LOUIS HOSPITAL, PARIS, ON THE TREATMENT OF CUTANEOUS TUBERCULOSIS BY THE KOCH METHOD.

In an interesting series of letters, WICKHAM has given (*British Journal of Dermatology*, February and March, 1891) a succinct report of the results obtained in the treatment of tuberculosis of the skin, especially lupus, by the special commission, consisting of such observers as Vidal, Fournier, Besnier,

Two were subsequently submitted, as above mentioned, to the complete operation. One, the case of sarcoma, acquired a recurrence in nine months, was resubmitted to operation, and remains well one year after operation. The remaining case, of more than half a year's standing only, is still free from recurrence. In two cases only was the artificial larynx required. The other patients were content with their whispering speech. The tracheal canula could not be dispensed with in any instance.

DERMATOLOGY.

UNDER THE CHARGE OF

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THE ABSORPTION OF DRUGS FROM OINTMENTS.

LUFF's interesting experiments (*British Journal of Dermatology*, June, 1890; *Monatshefte für praktische Dermatologie*, Bd. xi., No. 2) bearing upon the absorption of drugs from the three common ointment bases, tend to show that, as regards this property, vaseline stands first, lard second, and lanolin third. The drugs employed were resorcin, carbolic acid, and iodide of potassium. The author very properly adds: "These experiments have all been performed with sheep's bladders, and it may be urged that the results obtained with dead tissue are scarcely comparable to those which a living tissue, such as the skin, might effect. The settlement of this point must be left to future experiments upon the living subject. . . . The practical lesson to be learned from these experiments is, that if an ointment is employed with the view of its active ingredient becoming absorbed, then vaseline is by far the best excipient to use; but if an ointment is employed for its local effect only, absorption of its active ingredient not being desired, then lanolin is the best excipient for such an ointment."

[A full abstract of this paper, as regards the method and the exact results obtained, appeared in this journal for February, the inferences to be drawn therefrom having been left to the reader. It seems, however, as conveyed to us in a personal note from Dr. Luff, that the brief presentation of the data has been misinterpreted, and we give, therefore, with great pleasure, this additional abstract containing the conclusions in the author's own words.—Eds.].

PATHOLOGICAL HISTOLOGY AND NATURE OF LUPUS ERYTHEMATOSUS.

H. LOEIR (*Archives de Physiologie*, 1890) put forth the view in 1883 that lupus vulgaris is an attenuated tuberculosis of the skin, which the

without influence upon the life of the fœtus. In other cases, fœtal death undoubtedly resulted from their presence. In twenty placentæ examined, taken from healthy mothers whose children were healthy, forty-two infarctions were found, most of them upon the maternal side, occasionally supplemented by others upon the fœtal aspect. The most probable explanation of their presence seems to Jacobsohn to be as follows: The decidua undergoes a primary hyaline degeneration, and when in this condition the tissue can be stained by eosin and safranin. This process of degeneration attacks the endothelium of the bloodvessels, which, according to Waldeyer, are surrounded by decidual cells. The process gradually encroaches upon the intervillous spaces, coagulation of blood occurs, and the fibrinous portion of the infarct results from the clot. The villi of the chorion are finally destroyed so far as their functional activity is concerned, while in some cases the hyaline degeneration of the decidua destroys the villi by the encroachment of decidual cells.

A BACTERIOLOGICAL STUDY IN AUTO-INFECTION.

The marked reaction which has taken place against the prophylactic douche in healthy women suggested to STEFFECK the propriety of making a bacteriological examination of the birth-canal of such patients (*Zeitschrift für Geburtshilfe und Gynäkologie*, Band xx., Heft 2). His method consisted in removing a portion of the secretion of the parts, making cultures on appropriate culture media, and injecting the original matter and also cultures into the bodies of animals. Twenty-nine observations are reported in detail. Twelve of these gave positive results. In seven abscesses followed. In five general infection and death occurred. The germ most frequently found is the staphylococcus pyogenes albus. His experiments lead Steffeck to conclude that this germ, as well as streptococci, may cause puerperal infection which should be considered as auto-infection. Some inflammatory condition must be present, however, to furnish a place and opportunity for entrance to these germs. An examination of the statistics in the Würzburg clinic for periods when no prophylactic douche was given illustrates the practical value of a preliminary disinfection.

RUPTURE OF THE UTERUS IN TWIN LABOR.

An interesting case of rupture of the uterus in twin labor is reported in the *Glasgow Medical Journal* for March, 1891, by JENKINS, a student in Pawlik's clinic at Prague. The patient had seven hours previously given birth to a living child at her home. When brought to the hospital her general condition was good. A second child was found in transverse position. The pelvis was not contracted. The upper margin of the lower uterine segment was discerned at the level of the umbilicus. Under chloroform, decapitation was performed by the hook. No difficulty was experienced in delivering the head and the body, but upon introducing the hand into the uterus a large transverse rupture was found half an inch above the level of the internal os, involving the entire left half of the uterus. The peritoneum was intact, and rupture had occurred before admission to the hospital. The placenta had projected through the tear, giving rise to a swelling which could be appreciated by palpation. It was found that adhesion existed on the right side of the uterus

and Hallopeau. The cases were treated in the St. Louis Hospital, Paris, and numbered in all 38. The report, as given by this commission, was official and final, and upon the whole, strongly condemnatory. Briefly stated, the conclusions are as follows: They observed first, that in some cases the general reaction was so intensely alarming that death had been imminent; secondly, in eight cases congestion of the lungs resulted; thirdly, in two cases, hæmaturia; fourthly, in four cases, albuminuria; fifthly, in five or six cases, severe cardiac symptoms, such as violent palpitation and persisteut systolic bruit at apex. The local reaction varied from extremely moderate to erysipelatous. As to the resulting action upon the disease, not one case was cured, not one case even nearly cured, and scarcely a visible improvement in any. On the contrary, twelve results nil, the lesions remaining as before, and eighteen very slightly improved. With the negative and uncertain results, and the risks incurred, the commission does not feel justified, from its own experience, in continuing, except in an experimental manner, this method of treatment.

OBSTETRICS.

UNDER THE CHARGE OF

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VENTRO-FIXATION OF THE UTERUS AND SUBSEQUENT PREGNANCY.

GOTTSCHALK (*Centralblatt für Gynäkologie*, No. 8, 1891) reports the case of a multipara, aged twenty-eight years, from whom he had removed an ovarian tumor complicated with retroflexion of the uterus. The patient made an uninterrupted recovery. A year afterward the same patient came under Gottschalk's observation in the sixth week of pregnancy. Shortly afterward abortion occurred. The membranes and placenta were removed by the hand of the operator, and the uterus was found very high up in the pelvis and anteverted. In removing the placenta and membranes, the finger appreciated a difference in the two walls of the uterus; the anterior wall was thick and well preserved, while the posterior was almost as thin as paper. The explanation for this condition was found in the fact that the patient had been operated upon for a backward displacement of the uterus by the procedure known as ventro-fixation.

A STUDY OF PLACENTAL INFARCTS.

JACOBSON (*Zeitschrift für Geburtshilfe und Gynäkologie*, Band xx., Heft 2) has examined large numbers of placentæ, finding in syphilitic patients, in those suffering from nephritis, and also in women apparently in good health, white infarctions on the placental tissue. These seem at times to have been

(*Gazette Hebdomadaire*, No. 8, 1891) a method employed by them in the treatment of transverse positions of the fœtal head. By introducing one blade of a long forceps-shaped instrument, the endeavor is made by leverage to bring the head, when in transverse presentation at the pelvic brim, down into the inlet of the superior strait. Both blades of this instrument are then applied as usual to the sides of the head, and cord or tape is passed through the extremity of the fenestra in one blade, and traction is made downward as in ordinary axis-traction. The head is thus brought through the superior strait, turned transversely, and rotation is expected in the centre of the pelvic cavity.

EXTRA-UTERINE PREGNANCY.

KÜSTNER (*St. Petersburger medicinische Wochenschrift*, Nos. 43 and 44, 1890) describes five cases of extra-uterine pregnancy treated by laparotomy and the removal of the fœtus and appendages. Recovery ensued in all the cases. Of especial interest is the case of a patient, aged forty years, who had borne four children, and in whom the cessation of menstruation for three periods was followed by hæmorrhage persisting for six weeks, accompanied by the discharge of brownish particles. Shortly after, a second derangement of menstruation occurred, followed by a discharge of blood and shreds of membrane, the patient afterward complaining of intense pain in the region of the sacrum. Upon examination under an anæsthetic the uterus was normal; posteriorly upon the right side a hard body of considerable size was felt, while the left ovary and tube were somewhat enlarged. Upon laparotomy, it was discovered that double extra-uterine pregnancy had existed. Extra-uterine abortion had occurred in each case, and in both tumors microscopic examination revealed the presence of fœtal appendages. The extra-uterine pregnancy upon the left side had occurred nine years before the operation, and abortion had resulted at four months. Upon the right side pregnancy had occurred one year and seven months prior to operation, and the abortion had occurred at three months' gestation. Küstner's case makes twenty-one of double extra-uterine pregnancy. No positive cause for its recurrence was detected, and probably a persistent catarrhal salpingitis is the most rational explanation.

BANGA (*Journal of the American Medical Association*, No. 4, 1891) describes two cases of early ectopic gestation in which a diagnosis was made before operation, and in both of which a successful result was obtained. A point of practical interest in connection with one of the operations was the method employed to check hæmorrhage, which consisted in using a tobacco-bag tampon filled with iodoform gauze after the method of Mikuliez. In hæmorrhage occurring deep in the pelvis, pressure can often be made most advantageously by this expedient. One of the cases was that of hæmatoma of the broad ligament, resulting in the disintegration of the Fallopian tube of that side. Later on this developed into an hæmatocele in Douglas's pouch. The other case was that of extra-uterine pregnancy in the middle of the tube, a portion of whose muscular fibre was tremendously hypertrophied, while its opposite side was greatly thinned. The amnion was intact, containing an ounce of fluid and a fœtus five weeks old.

from former inflammation. The cavity between the uterus and the peritoneum was washed out with thymol and blood-clots were removed. The uterus was tamponed with iodoform gauze, the fundus pressed downward by an assistant. A large drainage-tube was also introduced. The patient's condition was remarkably good. The subsequent history of the case was that of recovery in about three weeks, daily irrigation, with a vaginal tampon, and drainage having been continued. When discharged the external os was drawn to the left, and above it a granulating cavity as large as a walnut was found. The internal os was displaced to the right and closed, the uterus movable, bound down upon the right side by old adhesions, while upon the left side new adhesions were forming.

A CONTRIBUTION TO THE THEORY OF ECLAMPSIA.

VON HERFF (*Münchener medicinische Wochenschrift*, No. 5, 1891) believes that the complex array of symptoms known as the eclamptic condition consists in a peculiar sensitiveness to irritation on the part of the sub-cortical centres. An easily decomposed material accumulates in the sub-cortical cells during gestation, resembling that found congenitally in patients suffering from nervous and psychical diseases, and in others intoxicated with urea, lead, alcohol, and infectious material. In other cases this condition seems to pertain to the physiology of the pregnant state. The condition known as eclamptic depends upon numerous organs of the body. When, in addition to this predisposing cause, active irritation is brought to bear, the result is frequently an outbreak of eclamptic convulsions.

ONE HUNDRED CASES OF INDUCED LABOR.

The literature of this subject is thoroughly reviewed, and the observations made upon one hundred cases are reported by PINARD in the first two numbers of the *Annales de Gynécologie* of the present year. He finds that once in one hundred and fifty pregnancies it is necessary to induce labor. Of the one hundred cases, one died of septicæmia resulting from infection during examination. Eighty-three of the children were born alive, sixty-seven of them surviving to leave the hospital. Version was performed fourteen times; the forceps used in twenty-one cases. In sixty-three cases Champetier's balloon was used to induce labor. This is a rubber dilator larger than a Barnes's bag, which is introduced and inflated and allowed to remain until expelled with the fœtus. Pinard considers the induction of labor at term justifiable only when the head can be made to engage by gentle pressure at the brim of the pelvis, and when the antero-posterior diameter of the pelvic inlet measures at least three and a half inches. To secure a living child he would induce labor at seven months in a pelvis of this size. He frequently employed Tarnier's dilator, which much resembles the Barnes's bag, the first dilatation being followed by the larger balloon.

THE VECTIS, OR OBSTETRICAL LEVER, COMBINED WITH TRACTION.

Adopting the theory of Poulet that a flexible tractor is best in combination with forceps, FARABEUF and VARNIER describe in a fully illustrated article

PREGNANCY COMPLICATING CANCER OF THE CERVIX; VAGINAL EXTIRPATION; RECOVERY.

TAYLOR, of Japan (*Medical Record*, No. 9, 1891) describes an interesting case of a patient aged forty-one years, who had carcinoma of the cervix, and early pregnancy, the exact period of which could not be ascertained. During the operation the bladder was torn, but was immediately closed and vaginal extirpation of the uterus performed. Considerable difficulty was experienced in bringing down the uterus, and hæmorrhage was finally checked by the use of forceps, ten of which were left compressing the tissues. Although the patient showed signs of collapse a few hours after the operation, she subsequently rallied and made an uninterrupted recovery. Some time after the operation she was in good health and actively employed. The uterus measured five inches in length, three and three-quarters in breadth, and two in thickness. The fœtus was of about two months' development.

THE BLOOD OF THE PREGNANT AND PARTURIENT WOMAN AND ITS RELATION TO THE AMNIOTIC LIQUID.

SCHRÖDER (*Archiv für Gynäkologie*, Band xxxix., Heft 2) has made a study of the blood in pregnancy and parturition in a series of forty-two cases. After reviewing the work of others, he concludes that anæmia is not a normal condition during pregnancy; that while there may be a slight decrease in the number of corpuscles and in the amount of hæmoglobin, yet that this decrease is never more than slight, and it commonly gives place to a normal condition of the blood early in the lying-in period. In proportion as women during pregnancy are without abundant food and subjected to hard labor amid unfavorable surroundings, anæmia is found to result. Labor causes a transient diminution in the corpuscles and hæmoglobin of the blood, especially marked where hæmorrhage occurs, as in placenta prævia. When the secretion of milk is well established the anæmia of pregnancy and labor gives place to a normal condition of the blood and often to an increase in its corpuscles and hæmoglobin. Schröder is led to conclude that the amniotic liquid is a serous transudate from the maternal bloodvessels.

GYNECOLOGY.

UNDER THE CHARGE OF
HENRY C. COE, M.D., M.R.C.S.,
OF NEW YORK.

CHYLE-CYST OF THE MESENTERY.

GUSSEROW (*Charité Annalen*, xv. Jahrg.) describes a mesenteric cyst, removed by abdominal section, the character of which was discovered on

INSTANT DEATH FROM AIR IN THE UTERINE VEINS IN THE FOURTH MONTH OF PREGNANCY.

HEKTOEN, pathologist to the Cook County Hospital (*North American Practitioner*, No. 3, 1891) reports an interesting case of death occurring after a vaginal douche, the patient being in the fourth month of pregnancy. The post-mortem examination revealed air in the sub-peritoneal vessels, in the coronary vessels, and in the right ventricle and auricle. Intra-uterine pregnancy of four months existed, the patient otherwise being healthy. There was no air in the veins of the broad ligaments, in the vena cava, or pulmonary arteries. The membranes had disappeared, and at the lower margin of the placenta, which was two and a half inches in diameter, a separation from the wall of the uterus had taken place three-quarters of an inch long. Beneath this separation the openings of the uterine sinuses could be readily distinguished. The air probably entered the circulation in considerable quantity at one time; the douche was taken with a Davidson's syringe which leaked. It is supposed that intermittent uterine contractions followed the injections, causing partial separation of the placenta, and that when relaxation occurred air entered the placental sinuses.

A SUCCESSFUL PORRO OPERATION.

In the *Indian Medical Gazette*, No. 2, 1891, a successful Porro operation upon a patient having a small pelvis is reported by SURGEON-MAJOR MACLAREN. The patient had been five days in labor, the child was dead, the membranes having ruptured, and the uterus was firmly contracted. She seemed moribund, and embryotomy was not permissible. The usual amputation was performed, the cervix being transfixed with a couple of steel knitting-needles, an India-rubber tube passed firmly around the cervix, below the needles, controlling the hæmorrhage. A glass drainage-tube was inserted on the umbilical side of the stump, which was dusted with aristol. The patient's recovery was uncomplicated.

THE DIAGNOSIS OF CONGENITAL MALFORMATION OF THE HEART.

This somewhat difficult subject is treated of in a very clear and satisfactory manner by HOCHSINGER in the *Wiener Klinik*, Heft 2, 1891. He concludes his treatise as follows: Endocardial murmurs over the orifices of the heart, with cyanosis and exaggeration of the second sound, point conclusively to a congenital inflammatory change in the valves at the venous openings. Harsh murmurs heard over the sternum, accompanied by cyanosis and exaggeration of the second sound, point to a patulous foramen ovale. Clear heart-sounds, with a high degree of cyanosis and a marked exaggeration of the second sound of the heart, indicate a congenital transposition of the origin of the aorta and also the origin of the pulmonary artery from the left ventricle. Cardiac murmurs which are not heard loudest over the valvular orifices of the heart, but which are accompanied by cyanosis and exaggerated second sound, point to a combination of congenital defect in the septa between the cardiac chambers and transposition of the valvular orifices.

between pelvic abscess, pyosalpinx, and suppurating ovarian cyst; the latter can only be made after microscopical examination of the wall, which in an abscess shows only a pyogenic membrane without any trace of an epithelial layer. All authors admit that extirpation of ovarian abscesses presents peculiar dangers, on account of the intensely septic character of the pus. In both cases the streptococcus pyogenes was found in pus, and pure cultures were obtained. In numerous examinations of the contents of a pyosalpinx the writer was never able to find them; and observations have been made by Orthmann and Menge with negative results, save in three cases. This fact, which speaks for the greater virulence of pus from ovarian abscesses, as compared with tubal, is explained by the fact that the ovarian tissue offers a better nidus for the pus organisms than the tubal mucosa. Rupture of a pyosalpinx is accordingly far less serious than rupture of an abscess of the ovary. Martin calls attention to the fact that suppuration of the ovary rarely accompanies gonorrhœal salpingitis, but is usually found in cases of pyosalpinx following septic endometritis, especially the puerperal form.

EPICYSTOTOMY FOR MALPOSITION OF THE URETER.

VELITS (*Budapesti kir Orvosegyesulet; Centralblatt für Gynäkologie*) reports a unique case, that of a girl, aged fourteen years, who had a third ureter which opened into the urethra. Tauffer performed epicystotomy, extirpated the terminal end of the duct, and sutured the remaining portion to the bladder, with perfect success.

CYSTO-FIBROMA OF THE OVARY OF UNUSUAL SIZE.

PETERS (*Nederl Tijdschr. v. Geneeskunde; Centralblatt für Gynäkologie*) removed an ovarian tumor weighing fifty-one and one-half pounds, which proved to be a true fibro cyst containing numerous communicating cavities. Drainage with iodoform gauze. Rapid convalescence.

NERVES OF THE HUMAN OVARY.

VEDELER (*Norsk Mag. f. Hægevid; Centralblatt für Gynäkologie*), from careful microscopical studies of the normal ovaries of a young girl who died suddenly, states that the final distribution of the nerve-filaments is the same as in the ovary of the sheep, *i. e.*, they accompany the bloodvessels and supply the muscle-fibres, but cannot be traced to the Graafian follicles.

OVULATION AND MENSTRUATION.

COHNSTEIN (*Centralblatt für Gynäkologie*, January 17, 1891) arrives at the following conclusions: 1. There is a direct causal relation between the ovarian and catamenial functions; the activity of the ovary precedes and causes the uterine flow. 2. If the ovary is inactive, neither does true menstruation occur, nor those changes in the uterus which accompany the monthly flow. 3. The ovaries may be functionally active without the occur-

microscopical examination of the contained milky fluid, in which were found characteristic fatty and granular corpuscles. This was still further confirmed by the absence of an epithelial lining in the cyst. On account of its size, it was impossible to infer whether it had arisen from dilatation of a lymph vessel or from cystic degeneration of a gland. The cyst was partially excised, and the remainder stitched into the abdominal wound, with good result.

PREGNANCY IN A UTERUS DUPLEX, COMPLICATED WITH PYOCOLPOS.

GUSSEROW (*Charité Annalen*, xv. Jahrg.) reports a unique case of *pyocolpos lateralis*, in a double vagina, with spontaneous rupture of the purulent contents into the cervical canal of a double uterus on the *opposite* side to the affected vagina. Pregnancy had advanced to the three months within the uterus on the *same* side, and was mistaken for accompanying pyometra, the ovum being removed on curetting.

THE ANATOMICAL DIAGNOSIS OF HÆMATO-SALPINX.

WALTER (Inaugural-dissertation, Giessen, 1890; abstract in *Centralblatt für Gynäkologie*, January 24, 1891), from careful microscopical observations, arrives at the conclusion that true hæmato-salpinx may be mistaken for ectopic pregnancy, not only because of their similar gross anatomy, but from the fact that bodies closely resembling chorionic villi are found in sections of the former; the former are, however, composed of structureless membrane, and are to be regarded as simply threads of fibrin. The presence of decidual cells must be demonstrated before the diagnosis of tubal gestation can be positively made. Other appearances are due to preëxisting catarrhal salpingitis.

THE SIGNIFICANCE OF CERTAIN UTERINE DISPLACEMENTS.

NIJHOFF (*Nederl. Tijdsch. v. Verlosk Gynäkol.*; *Centralblatt f. Gynäkologie*) summarizes a paper on this subject as follows:

1. Uterine displacements are often secondary to either peri-uterine inflammatory processes, or to a pathological condition of the uterus itself; this applies particularly to antero- and latero-flexions.
2. The symptoms accompanying a displacement are nearly always referable to the coexisting pathological deviation.
3. Treatment should be applied to the *lateral* deviation; when this is overcome the actual displacement of the organ may be cured without further treatment, or if it persists it gives rise to no pain or functional disturbance.
4. In classifying the different varieties of retro-displacement, it is more important to lay stress upon the mobility or fixation of the uterus than upon the degree of displacement.
5. Ventro-fixation is indicated after unsuccessful treatment of the existing complications.

OVARIAN ABSCESS.

SCHAFER (*Centralblatt für Gynäkologie*, January 10, 1891) reports two cases in which laparotomy was performed. The differential diagnosis lies

THE FORMATION OF PERITONEAL ADHESIONS AFTER LAPAROTOMY.

THOMSON (*Centralblatt für Gynäkologie*, January 31, 1891), after making a series of elaborate experiments and bacteriological studies in animals, makes the following deductions:

1. Adhesions of the omentum and intestine occur after perfectly aseptic laparotomies; exact apposition of the edges of the abdominal wound with silk sutures is the best means of preventing extensive adhesions.

2. Superficial erosions of the peritoneum heal without further consequences.

3. In order to prevent parietal adhesions of the intestines they should always be covered with the omentum previous to closing the wound.

4. Septic peritonitis following laparotomy may be due to atmospheric infection.

5. Sterilized gauze within the peritoneal cavity may cause the formation of adhesions.

 FORCIPRESSURE IN VAGINAL HYSTERECTOMY.

In a recent discussion on this subject at the Dresden Gynecological Society (*Centralblatt für Gynäkologie*, January 31, 1891) SCHRAUM commended the use of Richelôt's clamps, as they shortened the operation, saved loss of blood, and by causing extensive necrosis destroyed diseased tissue beyond the actual wound. He had not found that they caused excessive pain, as was claimed by some. The smaller forceps were removed at the end of twenty-four hours, the larger at the end of forty-eight.

LEOPOLD had noted unusual pain after using the clamps; he thought that there was great danger of carrying septic infection by means of them.

KLOTZ had twice used the forceps, and each time the patient had extreme pain after the operation, which he was able to assign to no other cause. He could see no advantage in using them instead of ligatures, as the latter could be applied rapidly and without excessive loss of blood. Cases in which the tissues were clearly diseased beyond the edges of the wound were such as were unsuitable for the radical operation.

MEINERT said that he had determined in future to extirpate the uterus even where the disease was advanced, since the patient's condition was really better than after a palliative operation. In these cases he had found the clamps especially valuable; in fact, it was sometimes impossible to use ligatures. He had never observed that their presence gave rise to excessive pain. He always removes them at the end of twenty-four hours, although five hours after the operation there should be no danger of hæmorrhage.

 ABDOMINAL EXTIRPATION OF FIBROID UTERI.

CHROBAK (*Centralblatt für Gynäkologie*, February 28, 1891) reports four successful cases of complete extirpation, and describes at length his method of procedure. He would not abandon supra-pubic amputation, with extra-peritoneal treatment of the stump, since he has operated by this method fifty-five times with only three deaths, but he believes that it possesses

rence of menstruation, as during lactation; the persistence of this activity is recognized by the response of the ovary to stimulation. 4. Menstruation may occur before the normal period, but it is none the less directly dependent upon preceding ovarian irritation, as from coitus. 5. The ovaries seem to alternate in forming ripe Graafian follicles. 6. It has not been proved that follicles rupture at every menstrual period.

STEINHAUS, in a monograph on this subject (abstracted in *Centralblatt für Gynäkologie*, February 7, 1891), reviews all the various theories which have been advanced, and arrives at the conclusion that none of them is perfectly satisfactory. Menstruation, he believes, is to be regarded as a special function of the oviduct, independent of that of the ovary. But, when the latter organ atrophies, atrophy of the oviduct follows, hence the cessation of its independent function, menstruation. This simple theory explains at once the persistence of the menstrual flow after castration, and reconciles the disputed views with regard to the relation between ovulation and menstruation.

[Unfortunately for the author's theory, pure castration, or removal of the ovaries alone, is now practically unknown. The persistent metrostaxis (*not* menstruation) after salpingo-oöphorectomy must be explained otherwise, as the effect of a continuous uterine congestion, due to pelvic induration or adhesions.—ED.]

THE TREATMENT OF PROLAPSUS AND RETROFLEXION BY LAPAROTOMY.

KÜSTNER (*Centralblatt für Gynäkologie*, January 17, 1891) reports fourteen cases in which he performed laparotomy. He resorts to it only when the ordinary methods of treating displacement (including Brandt's and Schultze's) prove ineffectual. It occasionally happens that, while the uterus is movable, the patient cannot wear a pessary on account of some anatomical peculiarity of the vagina or local tenderness, or several plastic operations may have failed to accomplish the desired result. If the organ is firmly fixed in an abnormal position, the indication for ventro-fixation is clear. The writer recognizes two classes of cases in which laparotomy is performed—in patients who are still capable of bearing children, and in those who have reached the menopause. In the former the adhesions should simply be separated (preferably with the Paquelin cautery), the adnexa not being removed unless they are extensively diseased, and the uterus retained in its normal position by a suitable pessary; in the latter, after breaking up the adhesions, the uterus should be attached to the anterior abdominal wall. In order to avoid the formation of fresh adhesions, strict asepsis is to be observed during the operation, with the avoidance of all injury to the peritoneum by mechanical or chemical irritants.

[The writer asserts that abortion is the inevitable consequence of pregnancy occurring in a uterus that has been sutured to the anterior abdominal wall, a statement which has been disproved by the experience of at least four German and American gynecologists, who have reported cases in which parturition occurred at term without complications or change in the position of the uterus.—ED.]

Less frequently we meet with a weak heart, especially in anæmic patients or those who have lost a good deal of blood during the pre-elimæteric period. The heart-beat is rapid and weak, the pulse feeble and irregular. These patients have dyspnœa, are liable to attacks of angina, and show evidences of obstruction to the circulation, œdema, and albuminuria.

In still a third class an accumulation of pericardial fat at the elimæteric gives rise to serious disturbances, especially to dyspnœa and palpitation on exertion. In more marked cases venous stasis, œdema, and albuminuria appear, and even grave pulmonary complications, but by careful regulation of diet these may be held in check until the period of danger is passed.

NEPHRECTOMY FOR URETERO-VAGINAL FISTULA.

GUSSEROW (*Charité Annalen*, xv. Jahrg.) met with an interesting case of uretero-vaginal fistula, in which he first performed kolpo-kleisis, having made a vesico-vaginal fistula. The latter closed, so that it was necessary to reopen it; then, after it had remained open for three months, kolpo-kleisis was again performed, and the patient was relieved for a year, at the end of which time she returned with cystitis and a collection of calculi in the vaginal pouch, which had caused a separation of the cicatrix. Nephrectomy was then performed, successfully, as a last resort.

PÆDIATRICS.

UNDER THE CHARGE OF

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A CASE OF TRACHEOTOMY FOR CROUP IN AN INFANT EIGHTEEN MONTHS OF AGE; CURED.

DIDIER (*Lyon Medical*, No. 29, 1890, p. 393), in the Charité during the winter months of 1889 and 1890, had the opportunity to make twelve tracheotomies in children under six years of age, attacked with croup. Five of the cases recovered. One is of particular interest on account of its age, eighteen months. Rabot remarks that cases of recovery under two years of age are unusual. Upon admittance the tonsils were swollen and engorged, presenting white patches, but without ganglionic involvement; dyspnœa marked and occurring in spasms. Tracheotomy was at once performed with ease and without much hæmorrhage. Upon the introduction of the canula an enormous piece of false membrane was expelled, the convulsions and nervous phenomena at once ceased; breathing was tranquil; no stitches were taken and the wound was dressed with carbolyzed gauze. The child passed through an uninterrupted convalescence, the temperature at no time reaching over

certain objections, which are entirely absent when the entire uterus is removed. In the latter operation no tissue is left behind which may become necrotic, and thus cause infection.

His technique is as follows: Unusual care is employed in disinfecting the vagina and cervical canal, the latter being cleansed with a 1 per cent. solution of sublimated alcohol, after which an iodoform pencil is introduced into the uterine cavity, and the vagina is tamponed with iodoform gauze. After the uterus is lifted out of the abdominal wound the broad ligaments are ligated in sections as low down as possible and divided close to the uterus. The anterior and posterior reflexions of the peritoneum are then divided, and the bladder is dissected away as low down as the cervix. The latter is now constricted with a rubber cord, and the tumor is excised. The stump and cervical canal are thoroughly cauterized, the latter is packed with iodoform gauze, and is closed with two or three sutures. An assistant removes the vaginal tampon and presses the posterior fornix upward on a grooved sound, with which as a guide the operator opens the fornix; passing his finger through the opening it is then easy for him to ligate and divide the lower portions of the broad ligaments and to complete the separation of the bladder. The cavity may be tamponed with strips of gauze, the ends of which are carried through into the vagina, or the vaginal vault may be completely closed with sutures introduced from within. The writer's practice is to unite the peritoneal edges by interrupted sero-serous sutures, covering the stumps of the broad ligaments with peritoneum in the same manner. After thorough cleansing of the pelvic cavity, the coils of intestine are allowed to fill it, and the external wound is closed, peritoneum, fascia, and skin being united separately. Lastly, the vagina is tamponed with iodoform gauze.

The average length of the operation described is about two hours, but the additional time required is more than compensated for by the excellent results. Whether prolapse of the vagina and bladder are liable to result from loss of support or not he is unable to say, for, although he has not yet observed this result, it is quite conceivable, since the conditions after removal of a large fibroid uterus are quite different from those which are present after ordinary vaginal hysterectomy.

TACHYCARDIA AT THE MENOPAUSE.

KISCH (*Internationale klinische Rundschau*, March 1, 1891; *Birmingham Med. Review*) calls attention to certain peculiar cardiac disturbances at the climacteric, chief among which is a paroxysmal tachycardia, occurring in plethoric subjects. Early in the period they are troubled with palpitation, which may persist for a few minutes or for several days. Associated with palpitation are feelings of apprehension, constriction of the chest, violent pulsation of the carotids, flushing and congestive headache. Vertigo and syncope may be present. The pulse ranges from 120 to 150, but is full and regular. The normal heart-sounds are exaggerated, but no organic murmurs are heard. The ordinary symptoms of cardiac disease, dyspnoea, dropsy and albuminuria, are absent, showing that the trouble is purely functional. The phenomena are to be ascribed to reflex irritation of the accelerator nerves, and no treatment is necessary beyond laxatives, exercise, and cold sponge-baths.

statements, the statistics of thirty-nine operations under two years of age is not flattering.

Didier was most unfortunate in that some of his patients contracted measles while convalescing from tracheotomy, the complication proving fatal. When croup arises as a complication of the eruptive fevers many French operators refuse to tracheotomize.

THE TREATMENT OF WHOOPING-COUGH.

In a lecture delivered at the Hospital for Sick Children, Paris, JULES SIMON (*Journal de Médecine*, 1890, p. 577) remarks that the treatment of the first period is of great importance, for the future progress of the case depend upon the care which is given to it at that time.

One must be well convinced, contrary to the method which was followed formerly, of the necessity of keeping the child indoors; it is often even necessary to keep him in bed as one would do for a serious attack of bronchitis. Arehambault has insisted upon the importance of this fact, and since Simon has adopted the same plan he has observed almost no complications in whooping-cough in children who were cared for in time. The pharmaceutical means are not to be neglected, but at best are only secondary; belladonna is, perhaps, the best of all. It is well to employ the following formula: Tincture of aconite root, tincture of belladonna, elixir of paragorie, equal parts—ten, twenty, or thirty drops a day, according to the age of the patient; if there is fever increase the aconite, or if intestinal catarrh increase the paregoric. Chloral may be given in the evening and sulphate of quinine in the morning. These drugs may be used by injection, the former in 15-grain doses, and the sulphate of quinine in three- to five-grain doses, especially if the heart is agitated. We must combat the catarrhal secretions if they are too abundant; under these circumstances an emetic may be given once a week; with the infusion of wild narcissus (daffodil) given every two or three days one obtains a state of mild nausea which favors the expulsion of the secretions; rhubarb will also diminish them, of this we may give from three to five grains of the extract before each meal. Coffee is advised, to combat the dyspepsia. The treatment for the third period is that directed to the bronchial adenopathy; it consists principally in the use of tonics, iodine, cod-liver oil, etc., and later, an outdoor life.

To the remedies referred to above one may add with advantage, in certain cases, henbane, to combat the meteorism, in doses of from two to ten grains a day, warm friction of the abdomen with chamomile oil, containing tincture of nux vomica, 4 parts to 100, combined with digitalis when there is anuria, a thing that often happens.

A CASE OF SPINA BIFIDA WITH SUPPURATIVE SPINAL MENINGITIS AND EPENDYMITIS, DUE TO BACTERIA ENTERING THE WALL OF THE SAC.

HOLT and VAN GIESEN (*Journal of Nervous and Mental Diseases*, 1890) record the case of a child who died in the fourth week of life, which shows quite clearly how a purulent inflammation of the wall of the sac and its dependent lesions of the cerebral nervous system may be due to the en-

39° C.; the patient was discharged from the hospital in three weeks entirely cured.

Since the diphtheritic cases have been isolated at the Charité there have been tracheotomized fifty-nine infants from the age of five to twenty-four months inclusive, with the following results:

Twenty at the age of twenty-four months: three cured. Two at twenty-three months: one cured. Three at twenty-two months: all died. Two at twenty-one months: all died. Four at twenty months: all died. One at nineteen months: died. Eleven at eighteen months: all died but one (the subject of this review). One at seventeen months: died. Two at sixteen months: one died. Two at fifteen months: both died. One at fourteen months: died. Two at thirteen months: fatal. Five at twelve months: all died. One at eleven months: died. One at ten months: died. One at five months: survived the operation for eight hours.

Sanne, in his *Traité de la Diphthérie* (1878), published twenty-three cases known in France and abroad, in which cure occurred in tracheotomized infants between seven and twenty-three months inclusive, thus classified:

Sixteen less than eighteen months old; two cases of eighteen months, operated upon by Potain and Moutard-Martin; and five older. He adds to the preceding, four incomplete successes in children who survived twenty-three, twenty-five, twenty-eight, and forty days after the operation.

Didier thinks that it is probable that many cases of young infants who have survived the operation have not been reported. Peter adds one case of cure at eleven months; several successes at sixteen months; one child of fourteen months, at the Hospital Necker, by Coffier; two cures of infants of twelve and eighteen months, by Hartmann; and a successful crico-tracheotomy by M. Geoffrier d'Orleans, on a child of eleven months.

If we follow Sanne's example, and only take the cases under twenty-three months inclusive, we eliminate from the statistics the three cures of two years upon twenty children operated upon at that age, and there only remain two successes to add to the preceding: first, the case of Didier, that we are considering; and, second, a communication by the same writer of a successful case in a child of twenty-three months, who was brought to the hospital with diphtheritic patches upon the buccal cavity, superimposed upon plaques of impetigo; excessive dyspnoea and general spasms.

Tracheotomy was performed by the interne, and excepting an attack of suffocation, which arose when the canula was removed to cleanse it, the child passed through a rapid and speedy convalescence to perfect health.

Didier adds still another case, a girl, aged seventeen months, in whom croup was present but diphtheria absent; tracheotomy was performed; at the end of a week the child was in good condition, but on attempting to remove the canula suffocation was produced, and it was necessary to reintroduce the canula; three more attempts were made to remove it, all, however, were followed by the same symptoms. In nineteen days the child entirely recovered.

These cases seem to prove that the tender age of the child is not a contra-indication to the performance of the operation; this statement is in accordance with the conclusions of Trousseau; and, indeed, Despine and Picot go still further, and say that we, as careful physicians, should not refuse the child this chance for life, no matter what the age. Notwithstanding these

seen in the severe symptoms which accompany summer diarrhœa. Fermentation processes may be of ectogenous or endogenous origin. The former are concerned almost exclusively with cow's milk and may begin within a few hours after the milk has been drawn. The lactic-acid fermentations are due to the breaking-up of the milk sugar, and vary according to the temperature at which the milk is kept. Endogenous fermentation may be a continuation of the ectogenous, and is easily possible, since the infant's stomach is not rich in hydrochloric acid, by which germs introduced with the food are easily destroyed. Fermentation processes associated with a milk diet, both in the stomach and small intestine, lead to acid dyspepsia and diarrhœa, by the destruction of the milk sugar. If the sugar reaches that portion of the intestine where it may be absorbed, the conditions will then be favorable for the decomposition of albumin. Milk which has undergone ectogenous fermentation will cause acute intoxication, with violent local symptoms of irritation, and sometimes collapse, cyanosis, and dyspœa. One form of endogenous fermentation is the isolated stomach fermentation with acid vomiting, atony, and ectasis of the organ. Other forms are the small-intestine fermentation with its acid diarrhœa, and the large-intestine fermentation with phenomena of mild colitis. Dyspepsia which is due to starch fermentation is very different from the sugar dyspepsias. In the former there is an acid feculent diarrhœa due to the presence of undigested starch in the lower portion of the bowel, and this tends to develop into chronic intestinal catarrh. After a while there may be symptoms resembling cholera, or the upper portion of the intestine or the stomach may be implicated.

PUBLIC HEALTH.

UNDER THE CHARGE OF

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WEIL'S DISEASE.

Physicians in the Southern States, where bilious fevers of every form are rife, may be able to render valuable aid in the solution of the question whether "Weil's Disease" is to be recognized as a distinct specific and communicable disease, or to be considered only as a form of relapsing fever intensified by coexisting or previous malarial poisoning. It appears to be more or less prevalent in Egypt, Syria, and the Balkan States, and a number of accurate and careful observations have, during the past year, been published in the Austrian and Slavonian medical journals. Dr. Frantisek Sumbera¹ reports three cases, Staff-surgeon Th. Hueber² four, and Dr. Justyn Karliński³ five; the first two contending for its specific character, which is doubted by the last,

¹ Dr. Frantisek Sumbera: *Sbornik Lekarsky*, iii. 2, 3, p. 298. 1890.

² Dr. Th. Hueber: *Deutsch. milit. ärztl. Zeitschr.*, xix. 1. 1890.

³ Dr. Justyn Karliński: *Fortsch. d. Med.*, viii. 5. 1890.

trance of pyogenic bacteria into the sac, and to their extension, along the fluids, meninges, or central canal of the spinal cord, to the brain meninges and ventricles.

At autopsy the volume of the lateral ventricles was found to be at least forty or fifty times their volume in a normal brain of the same age, but there was no corresponding expansion in the diameter of the brain; indeed, the brain itself was perhaps a trifle smaller than usual; five ounces of thin yellowish pus escaped from the ventricles during the removal of the brain. The lateral ventricles, their horns, and the third ventricle were everywhere lined with a thin, translucent, red membrane, having the appearance of granulation tissue. The meninges and the substance of the spinal cord were uniformly congested; the sac contained about half an ounce of pus.

Microscopical examination of the skin of the sac demonstrated beneath or internal to the subcutaneous connective-tissue of the skin, a zone of irregular thickness, composed of necrotic tissue; here great numbers of bacteria, of three kinds, were found: a few short, thick bacilli, some large cocci, and—the most numerous, predominating form—small cocci in chains and clusters.

In the section from this region in two places, microscopic plug-like continuations of the necrotic zone extended through the entire thickness of the excoriated central portion of the skin of the sac and communicated with the outer surface of the skin; these two plugs contain many small cocci.

In the section stained with Gram's method and examined with the Zeiss one-twelfth oil-immersion lens, small cocci, like the predominant form in the sac wall, were present in the pia mater, in the anterior fissure and its communicating channels, in the anterior commissure, in the exudate plugging the central canal, and in the pellicles lying over the pia mater; these cocci were also noted in a flake or pellicle of pus on the pons, in the walls of the third ventricle, the upper portion of the aqueduct of Sylvius, and of the lateral ventricles.

The morphological identity of the small cocci in the different regions, and the absence in the brain and cord of the other two forms of bacteria in the sac indicate the small cocci as the real pathogenic agents, and that the associated bacteria are merely contaminating forms. As far as can be determined by their dimensions and grouping, and by comparing them with other known species of pyogenic micrococci in control sections, the small cocci in this case are thought to be the streptococci pyogenes.

THE PATHOGENESIS OF DIGESTIVE DISORDERS OF BACTERIAL ORIGIN DURING THE NURSING PERIOD.

According to ESCHERICH (*Jahrb. f. Kinderheilk.*, Bd. xxxi., Heft 1, 2) digestive disorders in infants arising from the fermentation of milk, or from some condition in the contents of the intestines, must be distinguished from infectious diseases of the intestine which are due to microorganisms independently of the form of nutrition. The occurrence of the latter is associated with the fermentative activity of certain very common germs in an appropriate medium and under definite external relations. These germs form certain organic acids, which are irritating to the intestinal canal; and also ptomaines, the effect of which upon the central nervous system of infants is

the entrance into the organism of a microbe which exists outside of the body, and is widely or almost universally distributed in earth and dust. It has been induced in animals by the injection of emulsions of, or the juice expressed from, the sciatic nerve of men or other animals that have died of the disease. Nicolaier used common garden soil with success, though the same earth, when baked or otherwise sterilized, merely set up local irritation and abscesses. Rosenberg discovered and used a bacillus present in the substance of the nerves of tetanic individuals; Brieger employed a chemical product derived from pure cultures of the bacillus; Beumer used all these means; and Eiselsberg has recently reinvestigated the whole question.

The first impulse to research in this direction was given by Drs. Carle and Rattone, who, observing an extraordinary proportion of cases of tetanus among a number of workmen admitted to the hospital in consequence of injuries received by the fall of some old buildings in course of demolition, concluded that there must have been some common and local cause, and thought that it was most probably to be found in the dust that had entered the wounds. Inserting some of the dust gathered from the place into the subcutaneous connective tissue of various animals, they produced tetanus in the larger proportion.

Langer reported the case of five horses who died of tetanus after castration with the same écraseur, which, having been subsequently boiled in oil, was used without ill results.

Eiselsberg, having verified by experiment the results obtained by all previous observers, comes to the conclusion that the belief in the spontaneous origin of some cases of tetanus, like those of erysipelas, is based on errors of observation, some abrasion being present though unnoticed.

The greater frequency of tetanus after wounds, especially lacerated wounds of the hands and feet, is easily accounted for by the fact that, in the acts of grasping or treading, such wounds are most likely to be attended by the entrance of dirt.

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on the grounds that all his patients had suffered from malaria, that relapsing fever was prevalent in the district, the brother of one being in the hospital for it at the same time, and that he found in the blood of all a spirillus very like that of relapsing fever, though somewhat smaller and more comma-shaped.

Sumbera's patients, on the other hand, tradesmen between forty and fifty years of age, and Hueber's, soldiers from twenty-two to twenty-five years, had all been in good health up to the date of their attacks.

Sumbera's three cases and one of Hueber's ended fatally, the other three recovering, though very slowly. Only one of Karlinski's died, the other four making rapid recoveries, notwithstanding their previous enfeebled health. It is, therefore, by no means improbable that Karlinski interpreted the nature of their illness correctly, and that he had to deal with quite a different disease from that described by Sumbera and Hueber, in whose cases the course and symptoms of the attack and the post-mortem appearances presented so remarkable a uniformity, that one description will serve for all :

It set in suddenly, with rigors, headache, vomiting, fever, and pains in the back and limbs. Jaundice appeared variously between the second and fifth days. Angina was in Hueber's cases a distressing symptom. The jaundice was soon followed by marked enlargement of the liver, spleen, and inguinal glands. The urine was scanty and high-colored, albuminous or bloody; there was bilious or bloody diarrhœa, the breath was extremely offensive, and the liver and spleen tender. Death occurred in all on the ninth or tenth day, preceded by low delirium and coma. Post-mortem examination in all four fatal cases showed general icterus, fatty degeneration of heart, liver, etc.; hæmorrhagic pachymeningitis; the liver deeply bile-stained, and with dull swelling of the parenchyma; acute interstitial hæmorrhagic nephritis; and internal hæmorrhages in various organs. Neither observer was able to detect the spirillus in the blood.

Wassilieff identifies this disease with the typhus biliosus or icterodes kartulis of Smyrna; though he admits that the ill-trained practitioners of Asiatic Turkey and Egypt may mix up many cases of relapsing and pernicious malarial fevers with the true Weil's disease.

ETIOLOGY OF TETANUS.

Tetanus, as distinguished from the tetanic spasms of strychnine-poisoning, and the opisthotonus, etc., incident to some myelites, has generally been considered as a disease, or aggregate of phenomena, consisting essentially of a tonic spasm of all the muscles of the body, beginning with those of the jaws and neck, and ending with those of respiration. Two forms have been recognized—the traumatic and the idiopathic; the former always following the reception of some wound, either one into which dirt has entered, or which has taken on an unhealthy character; the other, in which no such cause has been discovered, has been attributed to exposure to cold and wet—such an explanation being, however, based on negative evidence.

But the researches of Carle and Rattone, Nicolaier, Rosenbach, Briéger Benner, Langer, and Eiselsberg, leave no room for doubt that it is properly to be classed among specific diseases, and that the phenomena are caused by

REED & CARNRICK will never add any new preparations to their list unless they possess important points of superiority over those in use by the Medical Profession for similar purposes.

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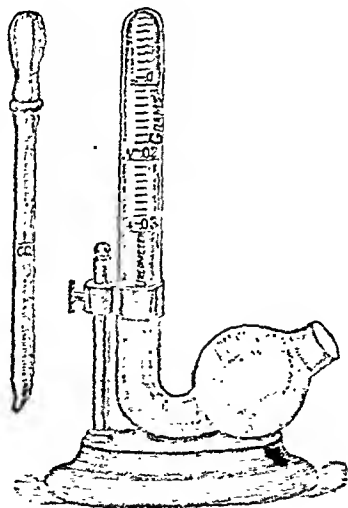
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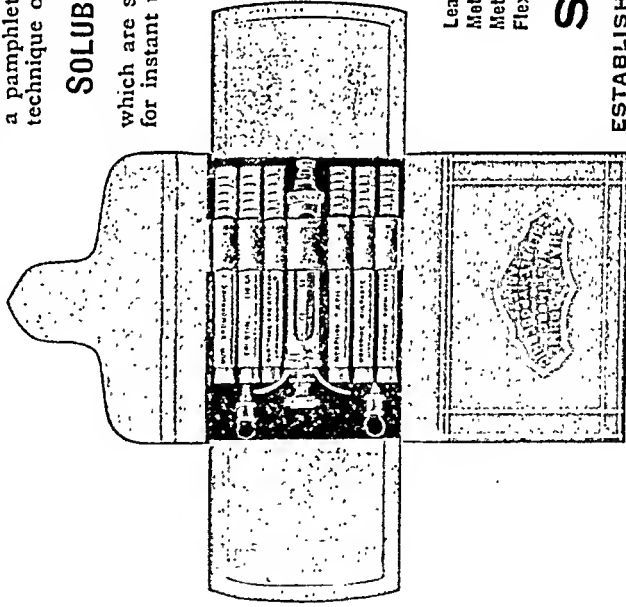
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
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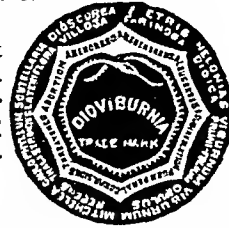
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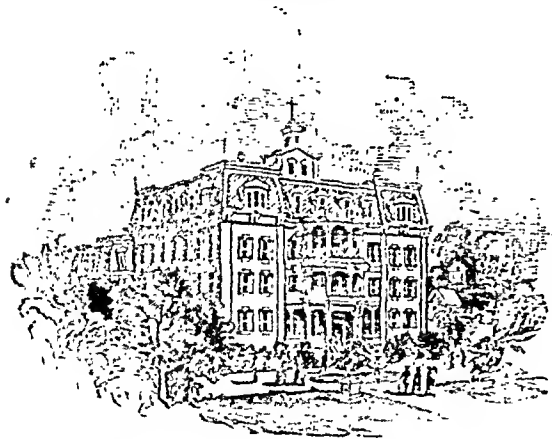
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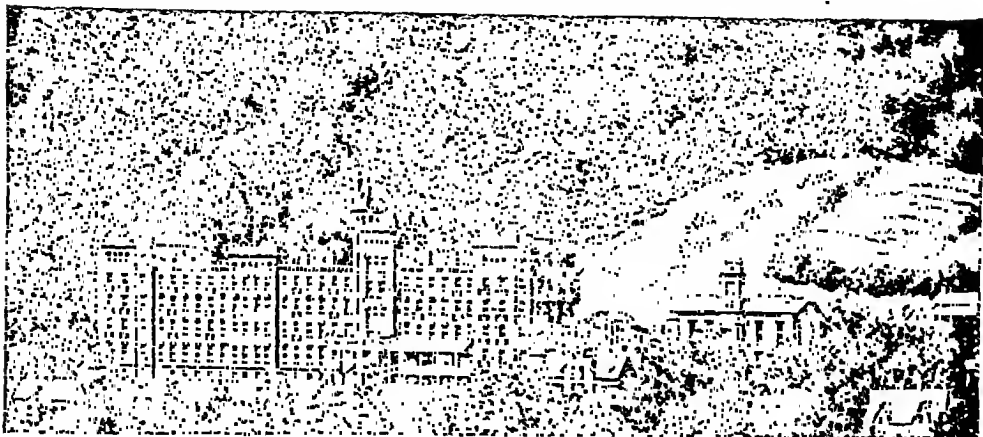
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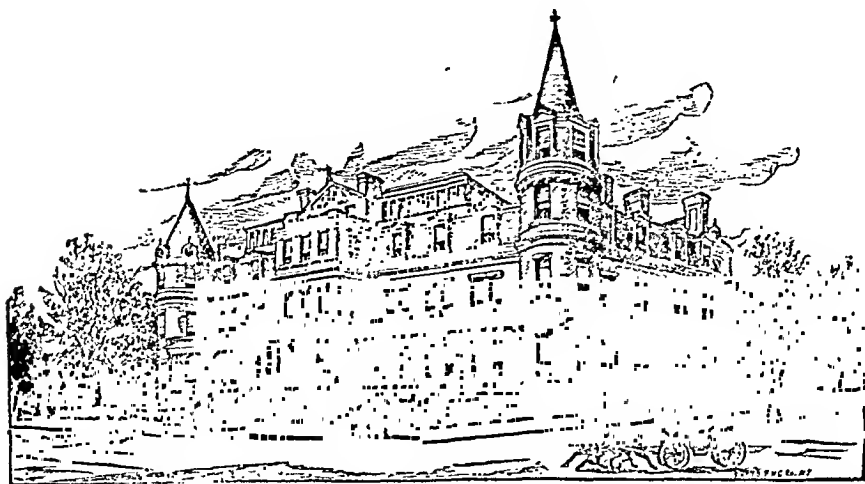
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
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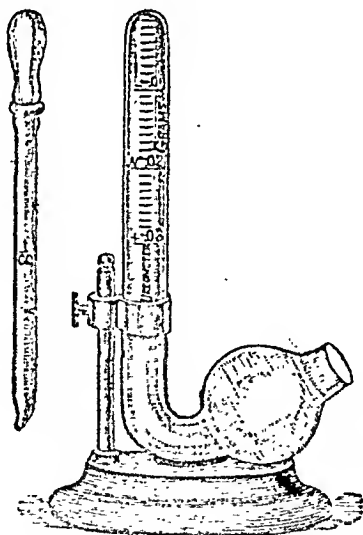
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SURGERY.

	PAGE		PAGE
Sponges and their Uses in Surgery	90	Operative Treatment of Rectal Cancer	93
Resection of the Appendix Vermiformis during the Quiescent Stage of Chronic Relapsing Appendicitis	91	Ligation of the Saphena Magna for Varicose Veins of the Lower Extremity	93
The Treatment of Hydatid Disease by Incision and Evacuation of the Cyst Without Drainage	92	Extirpation of the Larynx	94
		Palliative Operations in Cases of Enlarged Prostate	95

OBSTETRICS.

The Relation of the Weight of the Placenta to the Weight of the Child	95	Pernicious Vomiting and Ptyalism of Pregnancy as Hystero-neuroses	97
A Case of Retro-peritoneal Pregnancy	96	Five Hundred Labors Without Internal Disinfection	98
Intra- and Extra-uterine Pregnancy Occurring Coincidentally in the Same Patient	96	Hemorrhage from the Membranes During Labor	98
The Treatment of Premature Detachment of the Normally Situated Placenta	97	The Emotional Element in the Puerperal Period	98
Fetor of the Lochial Discharges	97	Induced Labor	98
		Curetting the Puerperal Uterus	99

GYNECOLOGY.

The Action of Antiseptics upon the Peritoneum	100	Paralysis Following Subcutaneous Injections of Ether	103
Uretero-vaginal Fistula	100	Cystopexy	103
Torsion of the Pedicle in Ovarian Cysts	100	The Relation of Heart Lesions to Pelvic Disease	103
The Treatment of Uterine Fibroids According to Apostoli's Method	101	Vesical Pain as a Symptom of Pyonephrosis	104
Intestinal Obstruction After Ovariectomy	102	Extirpation Uteri Sacralis	104
The Treatment of Osteomalacia by Castration	102	Unique Case of Foreign Body in the Vagina	105

PÆDIATRICS.

Asthma of Children	105	for Closing the Bladder Difficult, but Ultimately Successful	107
Removal of a Stone Weighing 365 Grains by Vaginal Cystotomy, from the Bladder of a Child Six Years of Age; Ureter Injured; Operations	1	Two Cases of Epileptiform Convulsions in Early Infancy	107

CONTENTS.

ORIGINAL COMMUNICATIONS.

	PAGE
Some Results of the Treatment of Tuberculosis with Koch's Lymph, or Tuberculin. By R. H. CRITTENDEN, Ph.D., and J. P. C. FOSTER, M.D.	1
Leprosy as Observed in Kashmir. By A. MITRA, L.R.C.P., L.R.C.S. Edin.	19
Lamneetomy: a Review of One Hundred and Three Cases of Spinal Surgery. By SAMUEL LLOYD, M.D.	25
The Etiology of Empyema in Children. By HENRY KOPLIK, M.D.	40
The Treatment of Erysipelas. By CHARLES W. ALLEN, M.D.	51

REVIEWS.

Influenza, or Epidemic Catarrhal Fever. An Historical Survey of Past Epidemics in Great Britain from 1510 to 1890. By E. Symes Thompson, M.D., F.R.C.P.	66
Koch's Remedy in Relation Specially to Throat Consumption. By Lennox Browne, F.R.C.S. Edin.	67
The Proclivity of Women to Cancerous Diseases and to Certain Benign Tumors; with Appendix on Heredity as a Cause of Cancer. By Herbert Snow, M.D. Lond.	68
Essentials of Surgery, together with a Full Description of the Handkerchief and Roller Bandage. By Edward Martin, M.D.	69
Recent Works on Diagnosis	70
The Barbarity of Circumcision as a Remedy for Congenital Abnormality. By Herbert Snow, M.D. Lond.	73
Essay on Medical Pneumatology: a Physiological, Clinical and Therapeutic Investigation of the Gases. By J. N. Demarquay	74

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

	PAGE		PAGE
Corrosive Sublimate as a Disinfectant	75	Piperazin	80
Ointment for Hemorrhoids	77	Administration of Amyl-hydrate	80
Antiseptic Treatment of Typhoid Fever	77	Death during Chloroform Administration	80
Vegetations on the Genitals	80	Iodoform and Aristol	81

MEDICINE.

Experiences with Tuberculin:		Tuberculin—continued:	
Production of Disseminated Mil- iary Tuberculosis	81	Abscess; Glandular Enlarge- ments; Remittent Fever	86
Acute Tuberculous Meningitis	83	Encouraging Result in Lupus of the Nose and Throat	87
Bacilli in the Blood	83	Batch of Good and Bad Results	87
Bacilli in the Fluid	83	Paracentesis of the Theca Vertebralis in Tubercular Meningitis for the Relief of Fluid Pressure	89
Histological Changes	84		
Untoward Effects in Tubercu- losis of Bones	85		

November 30, 1889. The appearance of the patient at that time was markedly anæmic, and he was troubled by a frequent dry cough. Pulse, 120; temperature, 102.5° F. Physical examination showed the following signs: Right lung sound; over left lung considerable loss of resonance on percussion; from the upper border of the fourth rib to the sixth rib there was marked dullness extending round under the angle of the scapula; on auscultation the vesicular murmur was found weakened throughout the whole lung and completely absent over the area of dullness previously mentioned. The patient admitted that for some months he had been suffering from pain in the left lung at the point indicated, and that he had had profuse hemorrhages every month since the preceding May. At this time, November 30, 1889, there was no expectoration. There were no moist râles or any other evidence of disease than already stated. On December 4th, the patient had a very profuse hemorrhage, and was compelled to remain in bed. From this date there was a gradual improvement, the temperature and pulse became normal, and on February 12, 1890, the patient was able to go to Florida. Up to this date there was practically no expectoration and consequently no microscopic examinations were made for bacilli. The patient remained in Florida and the Southern resorts until June, during which period he gained in weight and strength and "felt able and ready to resume work." On his way North, after very severe exercise, he was attacked by a violent hemorrhage, and this was quickly followed by another of still greater severity at Asheville, N. C. After he had regained sufficient strength he was examined by Dr. J. H. Williams, of Asheville, who wrote the following report, June 11, 1890:

"Examination of Mr. — shows exaggerated bronchial respiration on right side, which is compensatory. Percussion note good throughout. On left side there is supra-clavicular dullness, decreasing as you pass downward to fourth intercostal space, where the note is amphoric, which again fades away till the lower border of upper lobe is reached, where it is dull. Coarse râles in upper part and crepitant râles in lower. On posterior surface, left side, amphoric note clearly marked just below spine of scapula. Indication of cavity in lower part of upper lobe near the posterior surface."

The patient returned to New Haven in the middle of June, and has been under close observation ever since. On August 4th there was another serious hemorrhagic attack, and again during the first week in October. The loss of blood during this latter attack was quite remarkable. There were hemorrhages every three hours, night and day, from October 4th to October 10th, in which from one to three ounces of bright blood were expectorated each time. The progress of the disease in the left lung went steadily on up to December 3d. For some months there had been regular purulent expectorations. The cavity had increased in size and moist râles could be heard all through the portion of the lung remaining. The patient was extremely weak and anæmic, the loss of blood in October having left him bedridden. The digestive powers were so impaired that only milk and liquid foods could be used. The general depression was greatly out of proportion to the extent of the disease.

This somewhat lengthy history of the case up to December 3d shows a gradual progress of the disease in the left lung from initial consolidation up to the formation of a large cavity, with a possible distribution of the disease throughout the greater part, if not the whole, of this

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SOME RESULTS OF THE TREATMENT OF TUBERCULOSIS
WITH KOCH'S LYMPH, OR TUBERCULIN.

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THE discovery of a remedy offering such possibilities in the way of curative action as Koch's tuberculin has naturally led to a widespread trial of its efficacy in all forms of tuberculosis. Considering the nature of the disease in its several varieties, it is obvious that a true estimate of the power of the remedy can be formed only after long and repeated trials. It is only too plainly evident, however, from the tenor of the reports already published, that the remedy has failed to accomplish all that was at first hoped for. On the other hand, it is equally certain that when used with due precautions it may have, in some cases at least, a decidedly beneficial and curative action, the extent and permanency of which time alone can determine. Hence, all cases of treatment with the new remedy, if properly watched and the results recorded, cannot fail to afford data of more or less value in determining its limitations and the conditions under which beneficial results may be looked for.

The following report is a statement of the results obtained in a somewhat long-continued treatment of one case of pulmonary tuberculosis, one case of tubercular laryngitis, and three cases of lupus:

Case of Pulmonary Tuberculosis.—Male, aged twenty-eight years; occupation, electrical engineer. No known hereditary predisposition to consumption. This case first came under the observation of one of us on

14th. Injection of 2 milligrammes. This was followed by a comparatively strong reaction with considerable disturbance, as indicated by the following table:

	Time.	Pulse.	Temp.	Resp.
14th.	11 A.M.	84	98.9°	19
	11.15 "	Injection of 2 mg.		
	12 M.	82	98.5	19
	1 P.M.	91	99.1	25
	4 "	70	98.2	23
	8 "	95	101.1	16
	11 "	114	101.1	22
15th.	8 A.M.	95	100.0	26
	10 "	97	99.8	23
	12 M.	88	99.8	20
	4 P.M.	80	98.6	19

Extremities cold;
[vomiting.]

16th. No injection; patient depressed; profuse sweating and general malaise.

17th and 18th. No injection; increased appetite; restful sleep. Expectoration very slight, mostly mucus with only a few tubercle bacilli.

19th. Injection of 1 milligramme. No reaction.

20th. No injection.

21st. Injection of 2 milligrammes. This was followed by much the same reaction as on the 14th, without, however, the nausea and vomiting.

	Time.	Pulse.	Temp.	Resp.
21st.	10.30 A.M.	84	98.2°	16
	11 "	Injection.		
	1 P.M.	85	98.8	14
	2 "	83	99.6	16
	4 "	80	98.6	14
	5 "	103	99.0	16
	6 "	96	100.0	23
	8 "	104	101.0	20
	10 "	102	100.0	20
22d.	8 A.M.	83	98.6	16

23d. Injection of 2 milligrammes. This gave rise to a reaction similar to the preceding, but less severe, the temperature rising only to 100°.

24th to 26th. No injection. Up to this date there was certainly in many ways decided evidence of gain in the condition of the patient. The appetite had improved, likewise the digestive powers, so that solid food could be taken with comfort. Furthermore, after the depressing effects of the injection had worn away, the strength of the patient appeared to be increased; in other words, the remedy, even in the small quantities employed, appears to have had a general stimulating effect. In a general way, the expectoration seems to have been somewhat increased by the action of the remedy, although at no time excessive. On one or two days the increased expectoration was accompanied by a change in the character of the sputum, more pus conglomerations appearing, together with more mucus. The number of bacilli, however, remained essentially the same; in fact, this case has been characterized throughout by the small number of bacilli, both tubercular and other varieties, in the sputum.

lung. On the other hand, the right lung was perfectly sound, and possibly some portion of the left lung may have been in fair order. The weakness, however, was extreme, and this, together with the enfeebled digestive powers, rendered the moving of the patient to a more favorable climate impossible.

At the urgent request of the relatives of the patient, treatment with Koch's lymph was decided upon, with a clear understanding of the fact that the case did not belong to the class of incipient cases in which complete recovery could be looked for with certainty, but as one where at least some benefit might be expected, assuming the lymph to have the virtues ascribed to it.

The first injection was made on December 3d.¹ At this time the coughing was severe; the expectoration, however, was slight, not exceeding in quantity one ounce during the twenty-four hours, and the sputum contained only a few tubercle bacilli. A short time prior to the injection the pulse was 72, respiration 16, and temperature 98.8°. At 4.20 p.m. 0.5 milligramme of lymph was injected, temperature, pulse, etc., being recorded every hour. Four hours after the injection, the patient complained of a peculiar burning sensation at the seat of the disease in the left lung. This was followed two hours after by stiffness, soreness of the joints and a slight rise in temperature, 99.6°.

On the following day the injection was omitted, the only thing noted being a continued soreness in all the joints.

December 5. A second injection of 0.5 milligramme of lymph. This, like the first, was followed by a slight rise in temperature four hours after the injection, and the same sensation in the chest and soreness of the joints, together with a general feeling of chilliness.

6th. Injection of 0.5 milligramme without noticeable change in temperature, pulse, or respiration.

7th. Injection of 1 milligramme. Eight hours after injection, slight rise in temperature (1°), stiffness of the joints, severe attacks of coughing, with labored breathing.

8th. Injection of 1 milligramme. No noticeable reaction aside from increased coughing and the general feeling of malaise and soreness of the joints, which was very marked after these initial injections. There was almost no expectoration during the last three days.

9th. No injection, on account of the general depression and lassitude of the patient.

10th. Injection of 1 milligramme. Slight rise in temperature, pain over the left lung, same soreness of joints, shortness of breath.

11th. Injection of 1 milligramme. No reaction; a very quiet and restful day. Patient ate a little steak for the first time without disturbance of digestion.

12th. Injection of 2 milligrammes. At the time of injection the pulse was 86; temperature, 98.6°; respiration, 19. Ten hours after, pulse was 92; temperature, 100°; respiration, 23, with labored breathing.

13th. No injection; severe coughing during day and night. General malaise very pronounced.

¹ For this early receipt of the lymph the writer is indebted to the kindness of his friend, Professor Kühne, of Heidelberg. Later samples were received directly from Dr. Libbertz, R. H. C.

and at the same time had become more purulent, it seemed probable that in some portion of the left lung there was going on a partial breaking down of necrotic tissue, which, if unduly excited by further injections of lymph, might, from the inability of the patient to remove the necrotic matter, lead to an uncontrollable septic fever.

This temporary discontinuance in the use of the lymph was finally followed by the gradual lowering of the evening temperatures, until at last the temperature remained approximately normal during the entire twenty-four hours.

On March 10th and 11th, injections of 2 and 4 milligrammes respectively were made, without reaction.

13th. Injection of 6 milligrammes. Reaction very marked, temperature gradually rising, until eight hours after the injection it reached 104°, where it remained for two hours or more. No other unusual indications.

14th. Temperature normal, but patient still uncomfortable and languid from the reaction of the preceding day.

15th. Temperature and pulse normal. Restless night, great difficulty in breathing, and constant faintness, requiring stimulants and open windows to revive him. At mid-day, the patient had a fairly free hemorrhage of dark and more or less clotted blood, quite different in nature from his previous hemorrhages. In fact, the peculiar appearance of the material discharged, together with its marked putrid odor, was strongly suggestive of the hemorrhage having been caused by the breaking away of semi-necrotic tissue. It seems quite probable that this hemorrhage was at least indirectly connected with the very pronounced reaction induced by the injection of the 6 milligrammes of lymph on the 13th, and the effect on the patient was beneficial rather than harmful. At first, there was naturally considerable weakness, but the patient rallied after this hemorrhage as never before after a hemorrhage of like extent. Indeed, the removal from the lungs of such putrid matter as accompanied the blood discharged could not be other than ultimately helpful.

16th. Expectoration of a moderate amount of blood, of the same character as on the 15th, at intervals during the day. Pulse, full and of fair strength, 80.

17th. Temperature 99°; pulse 81; respiration 20. No bleeding.

18th to 21st. Patient quite comfortable with good pulse and normal temperature; apparently far less prostration than after an ordinary hemorrhage.

22d. There was another slight hemorrhage, followed on the 27th by several more profuse ones.

23d to April 5th. No injections. The patient gradually gaining strength and recovering the lost ground.

On April 6th, injections were again commenced, beginning with 1 milligramme and continued with gradually increasing doses up to the date of writing, without any pronounced reaction being obtained until 6 milligrammes of lymph were given, when the temperature rose to 102°.

In this case the treatment, so far as it has progressed, has not resulted in any radical improvement in the condition of the patient's lung. There has been a ready response to the remedy, and the reactions produced have agreed essentially with the descriptions given by Dr. Koch.

27th. A slight hemorrhage, the first since October 8th, with attendant weakness and depression.

28th to 31st. No further hemorrhage. On the 30th, an attack of labored breathing, relieved by strophanthus; no coughing or expectoration; pulse and temperature normal.

January 1, 1891. An egg for breakfast, the first solid food taken at breakfast for two months. Patient sleeps well, feels stronger, and is able to be dressed and up for several hours during the day.

2d to 9th. Injection of 1 milligramme of lymph each day. More or less of reaction following each injection, the temperature, however, never rising above 100° . On one day, accompanying the maximum temperature there was a slight chill with profuse perspiration. As in the preceding injections, even these small quantities of lymph produced a general reaction out of all proportion to the slight rise of temperature; soreness and stiffness of the joints, malaise, and a general feeling of discomfort being the prominent features. Although the fever reaction was slight, we deemed it injudicious to increase the amount of lymph while the general reaction was so pronounced. At the end of these eight successive injections, the weariness of the patient was so marked that the injections were discontinued until February 30th. During this period the temperature remained perfectly normal throughout, but the general weakness was so pronounced that it seemed unwise to add to it the fatigue incidental to the reaction of the lymph. During the last ten days of the resting period, the patient became stronger and felt decidedly better.

February 4. Injection of 2 milligrammes. No reaction.

5th. Injection of 2 milligrammes. Pronounced reaction; temperature rising to 100.2° , pulse 105, with stiffness of the joints.

6th and 7th. Injection of 3 milligrammes each day. On the 6th, the reaction was pronounced, the temperature rising to 100.3° , pulse 108. Considerable pain was felt in the left lung; considerable coughing; slight increase in expectoration; one or two periods of shortness of breath. On the 7th, the reaction was less pronounced.

8th and 9th. Injection of 4 milligrammes each day. No rise of temperature on either day. Malaise less pronounced than with previous injections. Good appetite, patient eating a hearty dinner without distress. The only noticeable feature was a profuse perspiration at several periods during the two days.

10th and 11th. Injection of 5 milligrammes each day. On the 10th, there was a rise of temperature to 100.2° . On the 11th, no rise in temperature. Sweating less profuse. Considerable coughing, but expectoration not over 10 cubic centimetres per day. Sputum, however, thick and purulent.

12th to 13th. Injection of 7.5 milligrammes each day. On the 12th, rise of temperature to 100.3° . No rise of temperature on the 13th. Almost no sweating; considerable dry coughing; no increased expectoration. Two very comfortable days, free from all malaise or pain in joints, etc.

14th. Injection of 10 milligrammes. No reaction.

Injections of lymph were then suspended until March 10th.

We were led to this by the fact that the evening temperature showed a tendency to rise to 100° , something unusual in this case, except under the influence of the lymph, and as the expectoration had diminished,

there was an ulceration decidedly gray and unhealthy in appearance, and the cord itself was so swollen as to entirely conceal the true vocal cord of that side. The right vocal cord was visible and apparently free from ulceration. The arytenoid of the left side was half again as thick antero-posteriorly as the right, the latter being one-half thicker than what might be considered normal for this case. The patient could swallow only on the right side.

The condition of the patient's lungs at this date was as follows: Consolidation of the right lung down to the third rib in front and half way between the spine of the scapula and lower angle behind. Over this entire region, large and small moist râles were very abundant. A few moist râles could be heard through the entire lung. On the left side, in the mammary region, was a spot slightly tympanitic. At the same level behind, the breathing appeared slightly bronchial. Infrequent râles were scattered through the entire lung.

From this it is plainly evident that the case was one of exaggerated laryngeal tuberculosis, complicated, as is usually found, with a seriously diseased condition of the lungs. Treatment with Koch's lymph was decided upon at the urgent request of the patient and his family, in the hope that some relief might be afforded the exceedingly dangerous laryngitis.

Prior to the injection of lymph, and for some time thereafter, the expectoration was quite abundant, the sputum being more or less watery, with lumps of mucus and pus. It was found exceedingly rich in the ordinary forms of mouth bacteria, and contained in addition a fairly large number of tubercle bacilli.

The patient was fairly strong, with good digestion and a fair appetite.

The first injection of lymph was made on December 4th. Temperature, pulse, and respiration were noted every hour, and the larynx was examined, as a rule, each day. All of the laryngeal examinations were made by Dr. Swain, to whom we are greatly indebted for his careful observation of the changes occurring in the larynx during the progress of the case. At the first injection, 1 milligramme of lymph was used. The temperature rose from 99.4° to 101° in three hours, and remained above 100° for two hours, after which it went down to 99.2°. There was a slight chilliness of the extremities at the time of fever, and an unusual feeling of dryness in the naso-pharynx and larynx.

5th. Injection of 1 milligramme. No noticeable rise in temperature. Several severe attacks of coughing with increased expectoration. Examination of the larynx showed a slight additional swelling in most of the infiltrated tissue of the already thickened parts, especially noticeable on the arytenoids and on the edge of the epiglottis.

6th. Injection of 2 milligrammes. Temperature did not rise above 99.9°. Hands and feet were chilly at times, and covered with cold perspiration. The left arytenoid appeared less swollen than on the previous day, and the ulcer upon the left false vocal cord had commenced to assume a slightly cleaner appearance. It is to be observed that on these first days of treatment hourly observations of temperature, continued up to midnight, and sometimes beyond that hour, failed to show any rise of temperature beyond 99.9°, except on the days when the lymph was injected.

7th. Injection of 3 milligrammes. Eight hours after the injection

As already stated, however, the general reaction produced by the tuberculin has been, in most instances, out of all proportion to the rise of temperature; in other words, general malaise, pain in the joints, etc., have been more pronounced with the small quantities of the remedy employed than the rise of temperature.

In one respect the reagent has produced a very marked effect. It has certainly had a decidedly stimulating action, this being manifest not during the period of injections, but in the after-periods, or periods of rest. It is to be remembered that the treatment was commenced at a time when the patient's strength appeared nearly gone; there was a lack of appetite and weakened digestion. After the use of the lymph, however, this condition was greatly improved; the appetite was stimulated, the patient's digestion responded to the increased tax upon it, until, finally, even more than the full complement of nutritive food was taken and assimilated each day. Coincident with this gain, the patient's strength was increased, and he was able to move about his apartments with greater ease than for some time past. The patient himself fully recognized the stimulating action of the remedy, and when the injections were discontinued for lengthy periods frequently remarked that he felt the need of more lymph.

On the other hand, the course of the disease in the lung has not apparently been materially modified by the use of the lymph.

During the later injections, the general or constitutional reaction produced has been less pronounced—that is, no marked soreness of the joints, malaise, or feeling of lassitude.

Further, in the later injections the sputum has tended to diminish in quantity, and at the same time to grow thicker and more mucopurulent.

Case of Tubercular Laryngitis.—Male, aged twenty-seven years. Body weight 136 pounds. Family history shows several cases of laryngitis. This patient was kindly submitted for treatment by Dr. Henry L. Swain, of New Haven, who has given us the early history of the case, as far as it came under his observation. Patient had been out of health for a period of five years, during which time he had had more or less continuous cough. For a year back he had been hoarse continuously, sometimes able to talk only in whispers. He had had several hemorrhages, the last occurring in May, 1889. In February, 1890, soreness was felt in swallowing on the left side. His throat was first examined by Dr. Swain on the 2d of June, 1890, at which time the condition of both throat and lungs was essentially the same as on December 4, 1890. On the latter date, lesions in the throat were as follows: Swelling of the epiglottis and redness confined to the left edge and the ary-epiglottic fold. The mucous membrane covering the left arytenoid and false vocal cord was swollen very considerably, and the upper surface of the arytenoid, as also a portion of the ary-epiglottic fold, presented decided erosions of the epithelium, but no very marked ulceration. On the false vocal cord

13th. Early morning temperature (7 A.M.) 98.8° . During the remainder of the day, the temperature varied between 100° and 102° , with a tendency to rise in the afternoon. Pain still persisted in the joints, together with periods of chilliness during the day. There was likewise a feeling of constriction in the upper part of the chest with severe coughing spells and increased raising of thick masses, in which no great increase of tubercle bacilli could be detected. There was likewise some vomiting, presumably caused by the use of digitalis, which had been prescribed a few days previous. A very clear view of the larynx was obtained, showing the ulcer on the left side of the epiglottis very red, but not as deeply colored as formerly. One portion of its edge presented a translucent appearance, as if either œdematous or covered with a thin layer of false membrane. Right vocal cord was visible its entire length. False vocal cord not swollen. Left vocal cord very plainly visible, with the ulceration less extensive, and the false vocal cord of the same side less swollen.

14th. Injection resumed, with 1 milligramme of lymph, although the body temperature was higher than normal. The only thing peculiar noted during the day was more or less "tickling" and pain in the throat, most marked eight hours after the injection, with temperature 102.2° , and long attacks of coughing and raising. Patient could not lie down comfortably owing to the condition of the throat.

15th. Early morning temperature 98.8° . Patient feeling quite weak. Highest temperature recorded, 101.2° at 9 P.M. No injection given. Observation of the larynx showed on the inner surface of the epiglottis, left side, a mass of tissue at the median border of the old ulcer, which appeared about to detach itself. Otherwise, the larynx appeared the same as on the previous examination.

16th. Morning temperature 98.5° . Injection of 2 milligrammes at 10 A.M. Highest temperature 101.2° at 8 P.M. Some sweating during the day, with a hard coughing spell of nearly an hour's duration, six hours after the injection.

17th and 18th. Morning temperature 98.7° . Highest evening temperature 101.6° . No injections. It is to be observed now, in distinction from what was stated under December 6, that even when no lymph is injected there is a decided tendency towards an evening rise of temperature.

19th. Injection of 2 milligrammes. Maximum temperature 102.3° nine hours after injection. Great difficulty in swallowing.

20th. Patient could scarcely swallow anything save a glass of milk. Solids only go down in very small quantities after repeated attempts; liquids pass down more readily, but are apt to be regurgitated. Swallowing, within the last few days, has been gradually growing more difficult, and the last injection of lymph appears to have produced an increased swelling, especially on the left side, with considerable pain. Examination of the larynx showed marked swelling of the arytenoid posteriorly, with redness of the ligamentum ary-epiglottici leading sideways to the palate. Local application was made to relieve pain in swallowing.

Maximum temperature to-day, without injection of lymph, 101.5° .

21st. Injection of 2 milligrammes. Maximum rise of temperature 102.6° eight hours after the injection. Swallowing somewhat easier.

22d. No injection. Maximum temperature 101.3° at 6 P.M. It is thus plainly evident that at this date the rise in evening temperature is

the temperature rose to 100.8° , accompanied by a chill which lasted for half an hour, followed by profuse sweating. A slight trace of blood was observed, tingeing the lumps of mucus in the sputum. There was a severe fit of coughing, with gagging, which finally terminated in vomiting. Throat felt constricted and sorer than usual.

8th. Injection of 3 milligrammes. Six hours after injection, the temperature rose to 101.2° , without the accompanying chill. Coughing was quite severe through the day.

9th. No injection was given on this day, as the temperature remained above 100° . Patient furthermore complained of soreness in the joints and of some pain in the right lung. There was also more or less depression. Examination of the larynx showed less swelling of the arytenoids and a cleaner appearance of the ulcers.

10th. Injection of 3 milligrammes. Maximum temperature 102.1° ten hours after the injection, accompanied by more or less oppression in breathing. Patient reports greater ease in swallowing than for a long time previously. Vomited once during the day; pain in the left side; stiffness of the phalangeal articulates; urine dark-colored, very thick, and of high specific gravity. Slept quietly all night without any spells of coughing.

11th. Injection of 3 milligrammes. Rise of temperature from 99.5° to 102.8° , ten hours after the injection. Soreness in all the joints; severe headache; face flushed; feeling of constriction in the lungs; extremities cold; back covered at times with perspiration; peculiar rattling in the left side of the chest near the nipple. This latter phenomenon continued with greater or less intensity for several hours. When first noticed it was not very marked, but rapidly increased so as to be very evident and alarming to the patient himself, and could be heard distinctly by any one standing near him. This peculiar rattling or gurgling sound was synchronous with the impulse of the heart, continuing when the breath was held, but was heard only when the patient was lying on his left side. It was probably due to an accumulation of liquid in one or more of the cavities of the left lung, the splashing being naturally produced through the agitation of the cavity by the cardiac movements. The heart-sounds were entirely normal and distinct through it all. No intermittence. Coincident with this apparent exudation, the urine was much diminished in volume. The twenty-four hours' quantity amounted to only 320 c.c., with a specific gravity of 1025.5. It was entirely free from albumin, sugar, etc., and contained 14.2 grammes of urea and 0.63 gramme of phosphoric acid (P_2O_5). This condition was relieved by treatment. On this date the larynx showed considerable improvement. Owing to the diminished swelling of the left ary-epiglottidean ligament, the epiglottis was more erect than formerly. The ulcers in the interior of the larynx were quite free from gray necrotic tissue, and showed some little color. The left vocal cord, which, up to this time, had not been visible, could now be distinctly seen, ulcerated on its free border. The left edge of the epiglottis was distinctly thinner.

12th. Temperature during the day oscillated between 100.1° and 102.4° . No injection was given. The urine was increased in volume to the normal quantity, and the patient appeared much more comfortable. No disturbance in the chest. Examination of the larynx showed the right vocal cord of paler color, and the ulcer on the right false vocal cord very superficial.

ary-epiglottic fold were found slightly thickened, but not reddened. This was the only thing observed that could account for the difficulty. At this date, the patient began to use the left side in swallowing, succeeding very well with fluids, aside from a little smarting—something which he had not been able to do for over a year. In the left fossa sigmoidea there was found a small swelling not previously seen. The ulcer on the left side of the epiglottis was plainly healing, as also that on the left false vocal cord.

19th. Maximum evening temperature 105°. On auscultation, at the lower border of the third rib, on the right side, very loud coarse râles were noticed. This was attributed to the breaking down of the tissue at this point. It was likewise observed that the moist râles over the left lung were much more persistent than formerly. In fact, there was every indication of a serious breaking down of both lungs. Coincident with this the sputum became much thicker, being filled with cheesy masses, and accompanied by an enormous increase in the numbers of tubercle bacilli.

20th to 22d. Same high fever temperatures in spite of treatment. Severe coughing followed by expectoration of very large dark-green masses, so large indeed as to produce gagging. The thick sputum contained an immense number of tubercle bacilli, the general outlines of which were not apparently different from the usual form.

23d to 25th. Maximum evening temperature 103°–104°. Expectoration had rapidly diminished in quantity. Prior to January 19th, the average amount of sputum for the twenty-four hours varied from half a pint to one pint, now it did not exceed three to four ounces.

26th. Fever less severe, the maximum temperature being 102° at 8 p.m. Patient was extremely exhausted and much emaciated. Swallowing, however, in the last few days had grown very much easier. The swelling on the right side of the larynx had entirely disappeared. The left side of the epiglottis was now quite healed and the median border of the ulceration appeared ready to heal. This was likewise true of the ulceration on the left false vocal cord. Further, the swelling of this latter cord had so far disappeared that the true vocal cord could be seen through its entire length. The two vocal cords appeared of about the same color and of the same width, but the free edge of the left was somewhat irregular, although no actual ulceration could be observed. The left vocal cord did not move quite as easily as its fellow. Moreover, the arytenoid of this side was only a trifle larger than the right arytenoid, the latter being almost normal in thickness.

During the next few days the temperature did not rise as high as formerly, but it was plainly evident that the patient's strength was nearly exhausted. The sputum retained its same thick purulent character and was full of tubercle bacilli. The larynx was seen daily, but on account of the weakened condition of the patient only hurried glimpses were obtained. This much, however, is certain, that up to twelve hours before death no swelling or ulceration occurred to alter the good condition of the various parts of the larynx above described.

For some time prior to this date the patient had been able to take a full amount of fluid nourishment, and on the evening before his death (February 2) had taken his normal complement of food. Indeed, two minutes before his death he drank easily, swallowing without difficulty.

always greater by one degree or more on those days when lymph is injected than when it is omitted, showing that the small doses of lymph still used continue to produce a slight fever reaction. Examination of the larynx showed the ulcer on the edge of the epiglottis to be granulating nicely, while the swelling of the left arytenoid was somewhat less, and its erosions disappearing.

23d and 24th. Injections of 1 milligramme each day. Maximum temperature 101.8° and 102.2° respectively. Throat still very sore, with great difficulty in swallowing. Sputum more purulent, and showing some increase in the numbers of tubercle bacilli.

The edge of ulcer on the left side of the interior of the epiglottis was found filled with bright-red granulations, and showed a tendency to encroach upon the margins of the epiglottis. Erosions were to be seen upon the palato-epiglottic fold. Vocal cords were clear, except the free edge of the left one. All ulcers in the interior of the larynx appeared clean and granulating. The lump of tissue mentioned a few days ago as on the epiglottis had almost entirely come away.

No more injections of lymph were given in this case. The morning temperature each day now reached 100° , and rose gradually during the day to 102° – 103° , in spite of treatment with acetanilid, phenacetin, etc. There was, likewise, more or less vomiting and great weakness. On the 29th, there was considerable pain on the right side of the chest, about the third intercostal space. The moist râles over the lungs had almost entirely disappeared. Respiration was full and easy. By January 2d, the patient was able to swallow much more comfortably. The condition of the larynx at this date was as follows: The ulcer on the edge of the epiglottis was less rethickened than formerly, and the entire edge of the epiglottis was thinner. The erosions on the palato-epiglottic fold had entirely disappeared. The swelling on the left false vocal band appeared to be growing steadily less. In the centre of the false vocal cord of the right side a new ulceration was to be seen, very red, with ragged edges.

January 3, 1891. The same high range of temperature. Quite a mass of necrotic tissue was thrown off from the throat, irregular in shape, and consisting of thoroughly disorganized tissue, mixed with mucus and slightly tinged with blood. It came from the median border of the left interior ulcer of the epiglottis. The left border of the epiglottis, where it is ulcerating, showed signs of cicatrizing.

4th. The evening temperature reached 103.6° ; the sputum was very thick and purulent.

9th. The bacilli in the sputum appeared much more numerous. The bacilli likewise seemed somewhat smaller and thicker at the ends, as if forming spores. Temperature was not quite as high during the last four days. The extreme edge of the epiglottis had healed, but the ulceration appeared to be advancing to the median line. Patient swallowed as easily as before the injections.

12th. At 8 p.m. the body temperature reached 103.9° . The ulcer on the right false vocal cord, which had steadily been growing less, appeared now to be entirely filled up and about to heal.

During the next week the patient's condition remained much the same except that he was steadily growing weaker. Maximum evening temperature ranged frequently between 103° – 104° .

18th. Maximum evening temperature 104.2° . Some difficulty in swallowing on the right side. The right side of epiglottis and the

The active portions at the time the treatment was commenced consisted of an irregular shaped ulcer in the locality indicated, about one inch in its longer diameter, while close to it, directly under the eyebrow, was a hard nodule as large as a good-sized pea. The eyelid was somewhat involved and there was a scarred appearance to the surrounding tissue extending into the hair, showing where the sore had been successfully combatted. During the first five years the patient was not under treatment, as the process of ulceration was not rapid. During the last three years the usual forms of treatment had been followed very thoroughly with only temporary relief. When apparently under control, it had broken out afresh each time either in the same or in a closely adjacent locality, until at the time the treatment with lymph was commenced it occupied the area above indicated.

The first injection of lymph was made on December 4th, the amount injected being 5 milligrammes. The patient was closely watched, the temperature, pulse, and respiration being taken every hour during the twenty-four hours following the injection and at varying intervals thereafter. No reaction followed this first injection. The temperature remained constant at 98° – 98.5° , and there were no perceptible changes in the appearance of the lupous swelling or surface, either on the day or night of the injection, or on the following day.

On December 6th, 10 milligrammes of lymph were injected. The temperature did not rise above 99.3° , and there were no noticeable changes in the appearance of the sore, either on this or the following day. The only thing noted was a darting pain around the edges of the sore, felt several times during the day, which the patient stated he had never noticed before.

The next injection, of 15 milligrammes, was made on December 12th. This gave rise to a decided reaction as indicated in the following table:

Time.	Temp.	Pulse.	Resp.
3.15 P.M.	98.8°	86	20
Injection.			
4.00 "	98.8	84	28
5.00 "	98.3	72	18
6.00 "	98.9	72	18
7.00 "	98.9	88	18
8.00 "	98.6	80	18
9.00 "	99.0	78	18
10.00 "	99.6	76	18
11.00 "	100.6	86	20
11.30 "	100.4	86	20
12.30 A.M.	100.3	88	20
2.30 "	101.0	98	22
4.30 "	100.6	86	20
7.45 "	99.0	84	18
8.45 "	99.2	84	18
10.35 "	98.3	76	17

Some evidence of this reaction remained until the evening of the 14th, in the form of a redness noticeable here and there on the affected surface.

19th. Another injection of 15 milligrammes was given, without any fever reaction whatever. Six hours after the injection the edges of the ulcer became slightly reddened and swollen, the scab appearing puffed out. This condition persisted for some hours, then disappeared.

His voice was clearer than it had been for some time past and possessed none of the elements due to mucus and ulceration, which had previously been so evident. His death occurred on the morning of February 2d, from the natural progress of the disease in the lungs, and was entirely free from the agony and terrible struggling for breath so characteristic of death from tubercular laryngitis.

We have, then, in this case very decided evidence of the healing and curative action of the remedy on tuberculous tissue in the larynx. It is further evident that this action is a very strong one, for it is to be remembered that the amount of lymph injected in this case at any one time never exceeded three milligrammes, and moreover that the process of healing was a continuous one, up even to the time of death and in spite of the extreme weakness of the patient. Moreover, the general character of the reactions induced by the remedy was, as seen from the foregoing report, essentially the same as described by Dr. Koch in his several communications, and its great power is likewise manifest from the intensity of the reactions induced by the small quantities employed. So far as it is proper to draw conclusions from this single case, the results would seem to suggest the advisability of continuing the use of the remedy in small quantities as long as favorable action can be obtained, and this would apply as well to cases of laryngitis not complicated with pulmonary trouble, from the evident tendency of the diseased portions of the larynx to become œdematous under the influence of the remedy and thus perhaps necessitate a tracheotomy to save the patient's life. This indeed may happen even with small quantities and with the exercise of the greatest care, and will doubtless always constitute one of the great dangers to be apprehended in the use of the remedy in laryngeal tuberculosis. Fortunately, in this case there was at no time any serious œdema; although such as was produced would probably have been increased to a dangerous extent by large doses of the remedy.

Although the patient died from the natural course of the tubercular disease in the lungs, the process was apparently accelerated by the use of the lymph, as was evidenced by the character of the expectoration, the physical signs which clearly indicated rapid breaking down of the lung tissue at the points previously noted as the most active seat of the disease, and the continuous high temperature which had not existed previous to the lymph treatment.

We are greatly indebted to Drs. T. G. Lee, L. S. De Forrest, C. A. Tuttle, and G. W. Lawrence for their continued assistance in watching the above case.

Case of Lupus.—A., male, aged sixty years, in good general health. This case, kindly submitted for treatment by Dr. Francis Bacon, was an ordinary case of lupus vulgaris of eight years' standing. The lupus was confined to a small area on the left side of the face closely adjacent to the eye, and extending a short distance upward on to the temple.

lymph, owing possibly to the quiescent state of the lupus, was yielding essentially negative results.

We are greatly indebted to Drs. Jackson and C. J. Foote for their assistance in watching the above case.

Case of Lupus.—C., female, aged thirty-three years. This was a case of very active lupus vulgaris of six years' standing. During this time it had been constantly under treatment. The original ulcer was situated on the right cheek near the nose, but was finally healed by the use of caustics. At the time the treatment with lymph was commenced the condition of the diseased parts was as follows: There was an ulcer just beginning on the right side of the nose; a second ulcer extended from the right nostril on to the lip; there was likewise an ulcer on the septum in the left nostril of the size of a five-cent piece; the skin of the nose was generally reddened and apparently diseased; the outer wall of both nostrils was partially destroyed by previous ulcerations.

The first injection was made on February 6th, at 11 A.M., with 10 milligrammes of lymph. Temperature 99.5° , pulse 94. At 3 P.M. the patient complained of a palpitation all over the body; the nose appeared much swollen, very hard, of a deep-red color, and very hot; the eyes were watery and the old scar much congested; a reddish papule likewise appeared on the cheek about four inches from the nose. At 5.30 P.M. the patient had a very pronounced chill; the nasal passages were greatly swollen, rendering breathing laborious; small red spots appeared on the left cheek, fifteen or twenty in number; there was pain in all the joints and the general malaise was extreme. At 7 P.M. the temperature was 103° ; at 9 P.M. 101.5° , with a pulse of 104; at 10 P.M. the temperature was 102° , with a pulse of 106; all of the symptoms previously noted were greatly increased, while the nose was fully three times as large as before the injection.

7th. At 10.30 A.M. the temperature was 100.6° , the nose still swollen and the old scars deeply congested; there were likewise small spots of congestion over both cheeks; the throat was somewhat sore, while the pain in the joints still continued. The temperature oscillated during the day between 100° and 101° .

8th. Temperature 99° to 99.5° . There was a general feeling of improvement; the pain in the joints was less, the nose less swollen, the cheeks no longer congested, and crusts had begun to form over the ulcerated spots. The general redness of the parts was less pronounced, and there was an apparent scaling on the lips and nose where no ulcers existed.

9th and 10th. Still evidence of the reaction. The temperature had fallen to normal, but the nose was still swollen; the crusts were decidedly thicker, especially on the upper lip. Portions of the skin of the nose and lip appeared white and waxy, while other portions had a deep-red and even purple color.

11th. The scabs on the outside of the nose and lip had fallen off, leaving good, clean surfaces. The scabs on the inside of the nose were still prominent, obstructing the breathing. The redness and swelling of the parts were considerably reduced, but there was a constant and more or less intense pain in the nose, referred by the patient to the outer walls of each nostril. The skin over the greater portion of the nose had a scaly appearance. The old scars had resumed their usual appearance, and the spots on the cheek had entirely disappeared.

The injections were repeated on an average of once a week up to the date of visiting, with gradually increasing amounts of lymph, the last dose consisting of 100 milligrammes. With this last dose there was a slight reaction, the temperature rising to 100.6°, and a more or less pronounced reddening of the entire face. Aside from the reaction of December 12, and the one just noted, no rise of temperature whatever followed these injections. Neither was there any very pronounced local change on or about the surface of the sore, such as has been described by Dr. Koch, or such as we have witnessed in a case of lupus to be described later. There was, however, after some injections, as in the two cases mentioned, a slight reddening of the lupous surface, accompanied it may be by a slight swelling. Other minor symptoms indicative of some action on the part of the lymph were noted from time to time, such as an irritation and inflammation of the eye adjoining the ulcer, with considerable conjunctivitis. Further, removal of the scab from the ulcer several times revealed indications of healthy granulation, but at this writing it is difficult to see any marked improvement either in the condition of the sore or of the nodule above the eye. There has been all though the treatment just enough of a suggestion of improvement to warrant the hope of some ultimate gain, in spite of the utter lack of any very marked constitutional reaction. During the treatment, the general health of the patient has been better than usual, so that, at all events, no apparent ill effects have resulted from the continued use of the lymph.

We have been greatly assisted by Drs. W. G. Daggett and J. H. Townsend in our observations of the above case.

Case of Lupus.—B., male, aged fifty years, in good general health. The lupus was confined to a spot on the side of the face extending from the left ear about two inches forward. It was of seven years' standing, and had never been very active. At the time of treatment it had a hard, elevated border, with smaller ulcerating spots scabbed over. Most of the surface was well cicatrized, but red and inflamed in appearance. The size of the whole sore was about two inches in diameter each way.

The first injection was made on February 1st with 5 milligrammes of lymph. This was not followed by any reaction whatever.

Injections were continued at the rate of one a week with gradually increasing doses of lymph up to March 8th, on which date 40 milligrammes of lymph were injected. On the 15th of March, a second injection of 40 milligrammes was made, after which the treatment was discontinued. None of these injections were followed by any elevation of temperature, or any other constitutional reaction. Further, there was during the treatment no change in the appearance of the lupous spot, except in one instance, in which the changes noted occurred two days after the injection. Thus, on February 22d, 20 milligrammes of lymph were injected without reaction. On the 24th the whole diseased surface assumed a deep-red color, felt "puffy," was decidedly swollen, and painful to the touch. This continued for forty-eight hours. At the same time a red papule appeared at the end of the nose, brilliantly colored and prominently elevated. During this period there was no change in temperature or other constitutional reaction.

The treatment was discontinued, as it was plainly evident that the

which, however, subsided more rapidly than with the preceding injections.

11th. 10 milligrammes of lymph were injected at 9.30 A.M. At 3 P.M. the temperature was 101.4° , the nose swollen and the diseased surfaces reddened. At 7 P.M. the temperature was 103.4° , at which point it remained until after 10 P.M. The general symptoms were less marked than on any preceding injection. The patient was able to sleep at night and there was an entire absence of cough, sore-throat, etc. On the following day the temperature was normal, while the congestion and swelling of the diseased surfaces were rapidly subsiding, thus showing a more rapid passing off of the reaction than on any preceding occasion.

29th. 10 milligrammes of lymph injected. Maximum rise of temperature, nine hours after the injection, 103.6° . The reaction, both locally and constitutionally, was far less intense than the preceding ones.

No further injection was given until April 18th. At this date, the change in the patient's condition was truly marvellous. Every vestige of the original ulcerations, which before the treatment were so conspicuous, had disappeared except one little point hardly larger than a pin's head, situated externally on the edge of the septum. The inner walls of the nostrils were perfectly clean and free from every trace of ulceration. New tissue had commenced to fill in at one or two points, and the entire external surface had a clean, natural look (although naturally scarified), aside from a possible exudation at one point on the right side of the nose very limited in extent.

An injection of 10 milligrammes of lymph on this date was followed by only a slight reaction. The temperature rose to 100.2° , while the local and general reaction was very slight as compared with those induced by previous injections.

In this case, then, so far as the treatment has progressed, we have a complete fulfilment of Dr. Koch's statements regarding the action of the lymph on lupus. What the final outcome will be time alone can determine, but at present there is every indication of a speedy and complete cure.

Why the remedy failed to bring about correspondingly pronounced reactions in the two preceding cases of lupus is difficult to determine. There can be no doubt that they were true cases of lupus vulgaris, although evidently in a more quiescent state than the case just described. Furthermore, the lymph used was the same in all three cases; in fact, in the case of lupus first described injections were made with five distinct samples of lymph without any noticeable difference in the result (April 30, 1891).

Obviously, any general conclusions regarding the efficacy of the remedy, to be of value, must be founded upon a larger number of observations than we have to offer. In view of this fact we refrain from drawing any deductions from the above-results, but present them as a contribution which may aid in the formation of a true estimate of the value of the remedy.

12th and 13th. Feeling of malaise nearly gone, although there were occasional pains in the back. Pain in the nose was less severe, the evidences of inflammation were disappearing, and the nose was assuming its usual appearance. Breathing through the nostrils was freer, although the passages were still obstructed somewhat by scabs.

15th. All signs of the reaction having disappeared, a second injection of 10 milligrammes of lymph was given at 11 A.M., with the temperature prior to the injection 98.2° . At 3 P.M. the patient was attacked by a severe coughing spell which continued intermittently for several hours. This was followed by a chill, and at the same time there appeared a white line entirely surrounding the diseased spots and the old scar on the cheek. At 5 P.M. the temperature had risen to 102.8° and the pulse to 108. The temperature remained at 102° to 103° , and the pulse at 110 to 118, until after 9 P.M., when both began to fall. The nose became swollen to two or three times its natural size, taking on at the same time a dusky red or even purplish color; the scar on the cheek was likewise much reddened. No spots made their appearance on the cheek as in the first reaction, but the general symptoms were fully as severe as on the preceding week.

16th. The reaction still continued quite severe, the whole diseased area being greatly swollen and congested. The temperature at 8 P.M. was 101.8° . The coughing had stopped, but the throat was very dry. There was a decided exudation and crusting over of the spots similarly affected last week, but the crusts were not as thick.

17th and 18th. Temperature normal. On the 17th the swelling was rapidly disappearing, and the patient appeared comfortable except on sitting up or moving, when the coughing was incessant and exhausting. There was considerable palpitation of the heart. The pulse was full and of fairly good tone. On the 18th there was less cough and the patient was able to sit up with comfort, although feeling quite weak. The appetite, which had failed after the injection, was returning. The throat appeared very sore; the entire pharynx was reddened, and on the base of the tongue was a white spot, and also on the soft palate, the latter spot being as large as a quarter of a dollar. These were apparently exudations similar to what had appeared on the skin.

19th. The general symptoms were all better; the throat, however, remained the same, and the weakness was so pronounced that a tonic was prescribed.

20th. The throat was nearly clear and the patient appeared much better. The nose has returned to its normal size and the crusts on the skin had fallen off; the ulceration spots within the nose, however, were still crusted over.

In view of the intensity of the reactions following these two injections, the patient was given a rest of two weeks.

March 6. A third injection was given, this time with only 5 milligrammes of lymph. There resulted, however, a reaction of the same order as the preceding, only of less severity and without the cough and sore-throat. The throat showed no signs of inflammation or white spots. The maximum temperature was 102.6° ten hours after the injection. The temperature remained slightly above 100° during the whole of the following day. There was great pain all over the body, which persisted for some time, and the surface was painful on pressure. There was the same swelling and congestion of the diseased parts as previously noticed,

mirees are notoriously filthy and negligent of even personal cleanliness. The soil of Srinagar is saturated with the filth of ages. The people have a scrupulous respect for all old and insanitary practices, and any innovation is looked upon as an oppressive measure. Cholera is not endemic, but frequently pays visits in epidemic form, during which violated Nature wreaks its full vengeance. The inhabitants of the valley speak a distinct language. They are either Mohammedans or Hindoos, the former predominating. The Kashmirees are a fine race—strong, muscular, generally fair-complexioned, and with true Aryan features. Rice forms their staple food, which they eat twice daily with boiled vegetables. Meat is also eaten. Fish is freely used, either fresh or dried.

Syphilitic diseases are the scourge of Kashmir. The rate of infant mortality is very high on account of syphilitic diseases. The disease is so widespread among all classes of people that it has almost assumed the magnitude of a national calamity. Tuberculosis and rickets are very rare. Leprosy is by no means common. It is certainly met with, but the proportion of lepers to the general population is infinitesimal. During the last six years I have not met with more than fifteen real Kashmiree lepers, of which only two were Hindoos.

In the beginning of 1890 a census of lepers was taken in Kashmir. The revenue officers took it unassisted by medical officers, consequently it could not be very correct. It has no doubt included many cases of other diseases than leprosy and might have overlooked many cases in the incipient stage. The following was the result of the census:

Estimated population, 602,184. Total lepers, 202—male, 168; female, 34. Hindoos, 4; Mohammedans, 198.

The slopes of the hills between the flat ground and the limits of forests are a mixture of cultivating and grazing grounds and forests of cedar and pine, etc. These slopes are inhabited by a class of people called Goojurs, or cowherds, who keep buffaloes and cows. In winter these Goojurs live at the foot of the hills, and in summer in temporary huts on the mountains. The Goojurs are darker in complexion than Kashmirees. They speak a different language and their habits of life are different. Their food is Indian corn, or maize, and wheat. They eat buffalo meat. Living in the territories of the Maharajah of Kashmir, within which cow-killing is a heinous crime, they are not at all beef-eaters. They seldom get fish, as they pass the greater part of the year on the mountains. Among these Goojurs leprosy is a common disease. Lepers are looked down upon and not allowed to mix freely in society in the Goojur country. The lepers therefore usually come to Kashmir or go to adjoining British districts in the Punjaub for means of livelihood. The Punjaub is very hot in summer, and Punjabi lepers

THE TREATMENT OF LEPROSY, AS OBSERVED IN KASHMIR,
BY NERVE-STRETCHING.

BY A. MITRA, L.R.C.P., L.R.C.S. (EDIN.).

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BEFORE proceeding with the subject-matter of this article, I have thought it proper to give a short description of the Valley of Kashmir, the beauties of which have been so often celebrated in prose and verse. The Valley of Kashmir, surrounded by snowy and lofty mountain ranges, is imbedded like a gem in the great Himalayan chain, stretching between latitude $33^{\circ} 15'$ and $34^{\circ} 35'$ N., and longitude $74^{\circ} 10'$ and $75^{\circ} 40'$ E. In form it is irregularly oblong, lying northwest and southeast, about 100 miles in length, with an average width of 20 miles. Its area is about 4500 square miles, and its average height is 5200 feet above the level of the sea. Its population is nearly 760,815. To Vigne a cursory view of the physical features of the valley gave an idea of its having been originally formed by the falling in of an exhausted volcanic region; but on detailed examination he agreed with the popular tradition that the valley was originally a large mountain lake. Whether the desiccation was due to volcanic action or otherwise, and whether it was gradual or sudden, are still moot questions. The mountains in and around Kashmir are chiefly basaltic in character, their usual formation being in some places composed of gray compact mountain limestone, in which marine fossils and shells are often found imbedded. That volcanic action is still at work beneath the surface of the valley is evidenced by the frequent shocks of earthquake. The soil of Kashmir is a very rich and fertile alluvium. Rice, cereals, and fruit trees grow luxuriantly. Numerous medicinal plants grow wild in the valley, such as *opelia chiretta*, *papaver somniferum*, *cannabis sativa*, *rheum palmatum*, *artemesia absinthum*, *aconitum ferox*, and *anthesis nobilis*. This extensive alluvial tract is intersected by the river Jhelum and its numerous tributaries. There are also three large lakes in the valley. In the rivers and lakes fish are found in abundance. There are several mineral springs scattered over different parts of the valley, chalybeate and sulphurous.

The climate of the valley is very similar to that of the south of Europe. It is therefore well suited as a health resort to those whose constitution has been broken by the heat of the plains of India. To phthisical patients the climate is also admirably suited. The hottest months are July and August, and the coldest months are December and January, when heavy snow usually falls. There is a most lamentable want of ordinary sanitation in Srinagar, the capital of Kashmir. The Kash-

livelihood. These lepers freely mix with the people, sit, eat, and pray with them (lepers are usually found at the doors of Moslem prayer-houses), and no precaution against contagion is thought of, still the disease does not spread among the Kashmirees. In India and in the northern hilly countries we find lepers freely mixing with their relatives, walking about in public streets; leprous husbands having progeny from their unaffected wives; in short, the public is exposed to the disease in every conceivable way. Does it extend in the proportion it ought if contagion by contact be admitted?

Of course, contagion by inoculation is possible, and often takes place in various ways. All the different ways by which syphilis can be passed from one individual to another extra-genitally hold good for leprosy. In India people usually have their feet and skin bare, and therefore there is every likelihood of inoculation. The question of compulsory segregation can only come where it is finally proved that leprosy is contagious by contact. It is no doubt a loathsome disease, with public feeling strongly against it. The word "leper" is synonymous with everything that is abhorrent. Whether this public opinion is right or wrong, we as scientific observers should lay aside our prepossessions, and steer clear of preconceived notions and prejudices. Then, again, it is difficult to conceive how segregation can be complete, even if it were tried for experimental purpose. Is it always easy to recognize the disease in its early stages? Is it not very common that early stages continue for a prolonged period, during which the contagion, if any, will be equally communicable as in later stages? Does it not sometimes baffle even experienced physicians to recognize and distinguish the disease from several forms of skin diseases and neuroses? Will not the rich try to evade, and the poor be submitted to unnecessary hardships?

It is not easy to conceive how isolation can be humanely carried out, and how it can be complete, regular, and perfect; and unless it is so its very object is defeated. I think, however, that, unless proved by fresh observations and experience, our present knowledge of the disease does not justify belief in contagion by contact.

HUTCHINSON'S FISH THEORY.—The Goojurs do not get fish. Since this theory first came to my notice in the pages of the *Lancet* I have always asked lepers if they have been fish-eating, and in the large majority of instances the reply was in the negative. The theory is untenable in India, where we do not find the disease more prevalent among fish-eating people than among abstainers from such food, as *vaisnabs*. The Kashmirees, among whom leprosy is rare, are fish eating, both fresh, dried, and salted. In India European sportsmen, planters, etc., use largely preserved fish, but there are no facts to show that fish-eating ever produced leprosy among them. High-class Hindoo widows are strictly

find that during the hot season eruptions frequently break into ulcers, which heal in the temperate climate of Kashmir. So, annually a large number of Punjabi lepers flock into Kashmir during summer and live on the charity of the Kashmirees. Thus, though Kashmir itself is comparatively free from leprosy, opportunities for treating lepers are by no means rare in Kashmir.

During the last five years I have treated nearly 500 cases of leprosy, a larger portion of them having been treated as outdoor patients at the Maharajah's Hospital in Srinagar. I now proceed to give my opinion on some points connected with the disease which will, perhaps, be found different from that given by several eminent members of the profession. In the republic of the medical profession, however, even its humblest member has a right to record his observations; nay, it is his duty.

HEREDITY.—Heredity is no doubt an important factor in the causation of leprosy. Such is the opinion I have formed after careful inquiry among Goojur lepers. I have seen a family with three generations of lepers. I have not seen acquired leprosy in children. Of course, in many cases heredity could not be easily traced, but in all such cases unsatisfactory answers were elicited. To the question, "Was your grandfather a leper?" the answer was, "I cannot say, as he died before I was born;" or some such answer. There are no doubt cases of acquisition, but among the Goojurs inheritance plays a more important part than acquisition.

Is **LEPROSY CONTAGIOUS?**—I saw one instance of a wife acquiring leprosy from an affected husband. Five years after marriage, the husband showed symptoms of leprosy; after another five years the wife became affected. When I saw the couple they had no children. I have seen in a family the grandmother, an old woman, suffering from a very bad type of ulcerative leprosy, attended with fetid discharge and sloughing. The affectionate daughters and granddaughters nursed her without the slightest thought of themselves. The old woman died two years ago. None in the family was affected. From my experience I can cite no instance in which the disease was transmitted from a leper to any member of his family, with whom he lived together and mixed closely in social life, except the one in which the wife was affected. The Leper Asylum in Calcutta is situated in the midst of a populous part of the city, and—if it be not the case now—fifteen years ago I saw lepers coming out of the asylum and begging at the adjoining houses, especially at a public school in that locality, but no one ever heard of special prevalence of leprosy in that quarter of the town. I know of several houses in Calcutta in which among old household servants there are lepers. Though leprosy is not common among the Kashmirees, still Kashmir is resorted to by a large number of lepers for its climate and means of

Abstract of Cases of Nerve-stretching for Leprosy at the Maharajah's Hospital, Kashmir.

No.	Sex.	Age	Variety.	Duration.	Period under treatment.	Nerve stretched.	Result.	Remarks.
1	M.	40	Anæsthetic.	5 years.	2 weeks	Sciatic.	No improvement.	
2	M.	35	"	2 "	1 week.	"	"	
3	M.	30	"	2 "	1 "	"	"	Gives history of heredity.
4	M.	33	"	1 year.	2 weeks.	"	Decided improvement.	
5	M.	40	Anæsthetic with tubercles.	2 years.	1 month.	"	Slight improvement.	
6	M.	40	Anæsthetic.	6 "	1 week.	"	No improvement.	
7	M.	36	"	5 "	4 days.	"	Slight improvement.	} Brothers.
8	M.	30	"	5 "	1 week.	Both.	"	
9	M.	35	"	3 "	2 weeks.	Sciatic.	No improvement.	
10	M.	35	"	2 "	2 "	"	"	
11	M.	36	"	4 months.	1 week.	"	Decided improvement.	Patient left the hospital very well satisfied with the result of treatment.
12	M.	30	"	2 years.	6 days.	"	Improved.	
13	M.	33	"	9 "	5 "	"	No improvement.	
14	M.	19	Mixed.	8 "	1 week.	"	"	
15	M.	40	Anæsthetic.	7 "	2 weeks.	"	"	
16	F.	27	"	1 year.	1 week.	"	Improved.	
17	M.	35	Mixed.	6 years.	1 "	"	No improvement.	
18	M.	29	Anæsthetic.	4 "	4 days.	"	"	
19	M.	30	Tubercular.	3 "	5 "	"	Improved.	
20	M.	55	Slight anæsthesia.	2 "	1 week.	"	"	
21	M.	40	Mixed.	2 "	1 "	"	"	
22	M.	33	Anæsthetic.	4 "	5 days.	"	"	
23	M.	35	"	5 "	2 "	"	No improvement.	
24	M.	37	"	1 year.	1 week.	"	Very satisfactory.	Anæsthesia disappeared.
25	M.	30	"	4 years.	1 "	"	Slight improvement.	
26	M.	26	"	7 months.	1 "	"	"	
27	M.	29	"	1 year.	2 weeks.	"	"	
28	M.	40	"	8 years.	3 days.	"	No improvement.	
29	M.	40	"	10 "	5 weeks.	"	"	
30	M.	37	"	7 "	1 week.	"	"	
31	M.	45	"	3 "	2 weeks.	"	"	Nodules present.
32	M.	47	"	2 "	2 "	"	Slight improvement.	
33	M.	30	"	9 "	1 week.	"	No improvement.	
34	M.	35	"	7 "	1 "	Ulnar.	"	Ulcers breaking.
35	M.	35	"	10 "	4 days.	"	"	
36	M.	47	"	5 "	5 "	"	"	
37	M.	50	"	3 "	7 weeks.	"	Improved.	
38	M.	54	"	2 "	2 "	"	"	
39	M.	50	"	2 "	4 days.	"	"	
40	M.	47	"	1 year.	5 "	"	"	
41	M.	32	"	4 years.	3 "	"	No improvement.	
42	M.	33	"	7 "	2 "	"	"	
43	M.	25	"	2 "	2 weeks.	"	Improved.	
44	M.	40	"	15 "	2 months.	"	Left hospital in same state as he came.	Ulcers all over foot and hand.
45	M.	35	"	3 "	1 month.	"	Slight improvement.	
46	M.	36	"	7 "	1 week.	"	No improvement.	

Total number of cases, 45. Improved, 14. Slightly improved, 8. No improvement, 23.

prohibited from taking fish, but I have seen several cases of leprosy among them. But the fact that leprosy is common among Goojurs completely disproves the fish theory.

VARIETIES.—By far the majority of cases among Goojurs are of the anæsthetic type, characterized by diminution or complete loss of sensation of one or both extremities, with characteristic flush in the face and thickening of the skin. The eyelashes usually drop off. In many cases trifling symptoms continue for a prolonged period; in others anæsthesia becomes general, and ulcers of a trophic kind break out, sloughing takes place, gangrene may follow, and natural amputation of phalanges, fingers, or toes occurs. Wasting of muscle takes place. In cases of anæsthetic variety nodules form in groups, which, as a rule, remain long as such. In the hot climate of India these nodules ulcerate more quickly. These nodules are pathologically analogous to lupus, and that is the reason, I believe, that Koch's fluid is said to have done some good in certain cases of leprosy. Perhaps the bacilli are not affected, but the large lepra-cells are.

BACILLI LEPRÆ.—I have on three occasions searched for bacilli. In one instance I found them from lymph in a vaccinated leper. No doubt the bacilli are always present; my method of staining, etc., was perhaps not accurate. Methylene-blue was the staining reagent used. The figure in Green's *Pathology*, page 378, 7th edition, very faithfully depicts the bacilli.

TREATMENT.—In the treatment of lepers, chalmugra oil, gurjon oil, both internally and locally, neem (*azadirachta Indica*), and arsenic have been given trial. In the ulcerative stages of both tubercular and anæsthetic varieties local applications of gurjon oil or neem oil prove of some value in healing and checking fetor. Creolin does the same. These, however, have little or no power in arresting the progress of the disease.

In the anæsthetic variety I have practised nerve-stretching in fifty-seven cases. I am of the opinion that in the early stage nerve-stretching produces very satisfactory results in a large majority of cases. The result, however, I regret to say, is not lasting. Still the patient feels very much better after the operation, and leaves the hospital in an improved condition. It often happens that the ulcers heal rapidly, the general health of the patient improves. This treatment can, therefore, be safely called a palliative treatment. The following is an abstract of cases treated by me:

the separated portions of the cord, but both these operators found the procedure impracticable. In 1889, Abbe,¹ acting upon a suggestion of Dana's, opened the spine with the same idea, or if failing in this, intending to make an attempt to unite some of the nerve-roots of the inferior detached portion of the cord to the posterior nerve-roots of the superior portion, hoping thus to furnish a means of communication between the severed sections. The difficulties of the operation proved too great to be overcome in this particular case, and the attempt had to be abandoned. Duncan,² in 1889, drew the sheath above and below a crushed portion of the cord together and stitched them there, thus relaxing the injured portion, but no improvement followed.

In spite of the sweeping denunciations of the earlier surgeons, and the bitterness with which its opponents have striven to prove the operation unjustifiable, we now have a sufficient amount of material at hand from which to deduce conclusions. Successful results are recorded not only in cases of traumatic injury, but in Pott's disease, tumors, and intra-dural section of the posterior nerve-roots for intractable neuralgias. We have tabulated all the cases up to date (February 28, 1891) whose records we have been able to find. Several of our cases have not yet been reported, and I am indebted to Drs. A. G. Gerster, J. A. Wyeth, C. K. Bridden, A. McCosh, C. McBurney, J. E. Kelly, R. T. Morris, and F. A. Manning, of New York; Geo. Ryerson Fowler and D. Myerle, of Brooklyn, and C. B. Stemen, of Indiana, for kindly placing the records of their unpublished cases at my disposal. I am also indebted to Dr. Southgate Leigh, of Mt. Sinai Hospital; Dr. Frank Le Moyne Hupp, of the Presbyterian Hospital; Dr. A. M. Newman, of Charity Hospital; and Dr. O. A. Schultze, of Roosevelt Hospital, for assistance in completing some of the histories. In this table we find one hundred and three traumatic cases, with fifty-eight deaths, of which thirty have occurred since the introduction of Listerism, and the other twenty-eight prior to that period. An analysis of these thirty cases shows that those of Halsted,³ both of Morris's,⁴ Hardie,⁵ Duncan,⁶ Allingham,⁷ Bell,⁸ Pileher,⁹ Jaboulay,¹⁰ and McCosh,¹¹ either died after the lapse of considerable time, or had other injuries which rendered a favorable result impossible. This leaves, therefore, only twenty cases where the operation could have had any effect upon

¹ New York Medical Record, July 26, 1889, p. 85.

² Edinburgh Medical Journal, March, 1889, p. 830.

³ Philadelphia Medical News, January 3, 1885.

⁴ Annals of Surgery, loc. cit., and personal communication.

⁵ Thorburn: A Contribution to the Surgery of the Spine, p. 20.

⁶ Loc. cit.

⁷ Brit. Med. Journ., 1889, vol. i. p. 838.

⁸ English Monthly Med. Journ., June, 1890.

⁹ Annals of Surgery, vol. xi. p. 186.

¹⁰ Lyon Médical, June 22, 1890, vol. lxiv. p. 265.

¹¹ Personal communication.

LAMNECTOMY: A REVIEW OF ONE HUNDRED AND THREE CASES OF SPINAL SURGERY.¹

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IT seems not out of place to enter a protest against the further use of the term trephining in connection with the spine. As a matter of fact, at the present time the trephine is seldom used for the removal of the posterior arches of the vertebrae, having given place to the mallet and chisel, or preferably to the rongeur forceps. I should prefer to speak simply of operations upon the spine, resection of the laminae, or perhaps lamnectomy (*Λαμνία*, a plate, a lamina; *ἐκτεμνω*, to cut out), instead of laminectomy,² which has been employed lately. This term has the advantage of being derived from two Greek words, instead of a Latin word and a Greek ending. The claim advanced by some recent authors that the first operation upon the spine was performed by Louis³ in 1762 may be correct in part; he may deserve the credit of having first cut down upon the spine and of removing comminuted fragments of bone, but Louis⁴ himself says that his patient suffered a fracture of the spine from a gunshot wound, and consequently had a compound fracture. In the present condition of surgery there can be no question of the advisability of operative interference in such cases as this, and therefore it is hardly necessary to consider Louis's case further; and as we shall have no reason to refer to compound fractures of the spine again, this case, together with the large number of others that might be collated, is passed over.

There can be no doubt that the credit of having first operated upon the spine (in 1814) belongs to Mr. Henry Cline,⁵ although the operation had been suggested by Heister⁶ and others. Between that date and 1882, when Maydl,⁷ of Vienna, attempted to remove some of the dorsal arches and unite the severed ends of the spinal cord, operations upon the spine were undertaken a number of times with little encouragement. In 1885 R. T. Morris,⁸ of New York, made a similar attempt to reunite

¹ Read before the Medical Society of the State of New York, February 4, 1891.

² Lane: London Lancet, July 5, 1890, p. 11.

³ Chipault: Gaz. des Hôp., September 13, 1890, p. 809.

⁴ "Remarques et Observations sur la Fracture et la Luxation des Vertèbres," Arch. Gén. de Med., 2d series, vol. xi. p. 397.

⁵ South's Chelius, London, 1847, vol. i. p. 539.

⁶ A General System of Surgery. Seventh edition, Book I., chap. vi., p. 143. London, 1745.

⁷ Albert: Lehrbuch der Chirurgie, Vienna, 1884, vol. ii. p. 55.

⁸ Annals of Surgery, vol. iii. p. 490.

Burrill, from the tables of the Boston City Hospital,¹ has compiled 82 cases with 64 deaths, 79 per cent. Of the 22 per cent. of recoveries, only 11 per cent. were satisfactory, the other 11 per cent. being completely disabled. Of the fatal cases the greater number died within a few days.

In addition to the one hundred and three traumatic cases we have tabulated thirty-nine of Pott's disease, eleven tumors, and five intra-dural nerve-sections, making a total of one hundred and fifty-five operations upon the posterior arches of the spine.

We have found that the percentage of deaths in all the cases operated upon for the relief of symptoms due to traumatism was 56 per cent.; but the percentage of all the other classes taken together is but 26 per cent., showing that the mortality is 30 per cent. higher in the former than in the latter series. The mortality of traumatic cases operated upon prior to Listerism was 63 per cent., since Listerism 50 per cent.

In the cervical region there are in the non-antiseptic class ten cases. Seven died; five from the spinal injury, and two from other causes; two, one of resection of the sixth and the other of the fifth and sixth arches, made partial recoveries, while one recovered from the operation, but having sustained a complete crush of the cord, showed no improvement in symptoms.

In the antiseptic series of eighteen there were fifteen deaths; one of these, however (Morris's), survived ten months, and should be included among the unimproved. In addition to this, one of Hardie's, one of Jones's, one of Bell's, one of McCosh's, and Manning's were practically hopeless at the time of the operation, while in Bell's first case the author says "the operation did not seem to complicate the case in any way." Including in the statistics all these cases except Bell's, in which there were other injuries that would probably have proved fatal, we still have thirteen deaths due to the operative manipulation, 72 per cent. Excluding all those enumerated, the percentage is only 44. In this series there is one cure, 5 per cent.; one improved, 5 per cent.; and two unimproved, 11 per cent.

In the dorsal region there were seventeen cases operated upon prior to the introduction of antiseptis, with twelve deaths; two of the latter should not be included, one having died of general œdema after fifteen weeks, and the other of fractured ribs and pyo-pneumothorax, making 58 per cent. of deaths due to spinal injury. Two cases, 12 per cent., show incomplete recovery, and three, 18 per cent., no improvement.

In the second series (antiseptic) there are twenty-eight cases, with eight, 28 per cent., deaths. One other death occurred at seven months, and another at five months after the operation, and consequently they

¹ Medical Publications of the Harvard Medical School, 1887.

the ultimate result. In these last, one of Jones's¹ was found to have suffered a crush of the cord opposite the 4th, 5th, and 6th cervical vertebræ, and would probably have died, even without the operation, from the traumatic inflammation of the cord involving the point of origin of the phrenic nerve. The same condition of phrenic disturbance existed in one of Jaboulay's, one of Bridden's, one of Bell's and Manning's, and Keetley's² cases.

Of the twenty-eight not treated antiseptically: Tyrrell's,³ Holscher's,⁴ Rogers's,⁵ Laugier's,⁶ Hutchinson's,⁷ Potter's second case, McDonnell's,⁸ and all three of Nunneley's⁹ had other injuries to which the fatal issue could be traced, making eight of the twenty-eight that can be attributed to other causes than the operation.

If now we consider all the deaths due to the operation, we find that in the antiseptic class, 50 per cent. survived; but if we exclude those enumerated the mortality would be only 25 per cent. In the non-antiseptic series, including all the cases, we have 63 per cent. of deaths, or excluding those due to other injuries, 45 per cent. In this latter series we have one cure, 2 per cent.; seven partial recoveries, 16 per cent.; two results unknown, 4 per cent.; and five showing no improvement, 11 per cent. In the first series, however, there are four cures, 6 per cent.; fifteen partial recoveries, 25 per cent.; one unknown, 1 per cent.; and eleven no improvement, 18 per cent. This is a more favorable showing than Ashhurst was able to make from his table of forty-three cases.¹⁰ He had 72 per cent. of deaths, 9 per cent. not benefited, 9 per cent. improved, and 9 per cent. whose results were unknown, and no cures. Thorburn's¹¹ statistics of 61 cases did not include those of Goldsmith,¹² Boyer,¹³ Massoneuve,¹⁴ Eve,¹⁵ Halsted,¹⁶ Pinkerton, Morris,¹⁷ nor any later than June 29, 1889.

It is interesting in this connection to compare the statistics of the antiseptic class with those of fractures treated conservatively. Thus, Gurlt¹⁸ reports 217 deaths out of 270 fractures, over 80 per cent.; while

¹ Thorburn, loc. cit., p. 26.

² Brit. Med. Journ., 1888, vol. ii. p. 421.

³ Tyrrell: Cooper's Lectures on Surgery, 1825, vol. ii. p. 20.

⁴ Hannov. Annal f. d. ges. Heilk., Bd. iv. 1839, p. 330.

⁵ Amer. Journ. Med. Sciences, O. S., vol. xvi. p. 91, 1835.

⁶ Bull. Chir., vol. i. p. 401.

⁷ Amer. Med Times, 1861.

⁸ Dublin Journ. Med. Sci., vol. xl.

⁹ Med. Times and Gaz., August, 1869.

¹⁰ International Encyclopædia of Surgery, vol. iv. p. 890.

¹¹ Surgery of the Spinal Cord, 1889, p. 144.

¹² Gross's System of Surgery. Second edition.

¹³ Heyfelder: Traité des Resections (trans. by Boeckel), p. 244.

¹⁴ Chipault: Gaz. des Hôp., September 13, 1890, p. 809.

¹⁵ Philadelphia Medical News, January 3, 1885.

¹⁶ International Encyclopædia of Surgery, vol. iv.

¹⁷ Loc. cit.

¹⁸ Handbuch der Lehre v. d. Knochenbrüchen, 1864, vol. ii. p. 172.

on his side. The extensive ecchymosis is fading, but the parts are very sensitive to pressure.

"June 2. Still catheterized. Discharged, improved, June 3d."

On July 29, 1889, I first saw the patient at his home. He was confined to his bed, his right thigh slightly drawn up and the leg flexed. There was little or no atrophy, but loss of sensation and paralysis with incontinence of feces and of urine. A bed sore a little larger than a silver dollar existed over the sacrum. As he was suffering with a severe diarrhœa, it was impossible to make a careful examination for several days, but on August 7th he had recovered sufficient strength for me to examine him thoroughly. There was then a tumor of some size over the lumbar vertebræ, and consequently no depression or other sign of fracture could be discovered. I suppose this thickening was due to the hæmatoma that existed at the time of the accident. He had pain running down the right leg and in the toes of the foot on that side, and still had incontinence of urine and feces. He was able to stand by holding on to the furniture, but could not stand erect. His right leg was flexed on the thigh and his body bent at about 20° from the perpendicular. Anæsthesia was present over the region indicated in the figure.

Electrical reactions are shown in the following table:

Left galvanic.	Left faradic.		Right faradic.	Right galvanic.
KCC>AnCC	50	Peronei	Lost	Total loss 8 in.amp.
KCC>AnCC	52	Anterior tibial	Lost	" " 10 "
" "	54	Posterior tibial	Lost	" " 8 "
	Lost	Glutei	Lost	
	Preserved	Tensor vaginæ femoris	Preserved	
	Diminished	Posterior thigh muscles	Diminished	
	40	Adductor	69	
	70	Biceps	72	

Reversals at 10 milliampères; no reaction.

Is able to have sexual intercourse, without emission or sensation, but occasionally has an emission during sleep with the usual sensations. Has some voluntary control over the muscles of the thigh, but practically complete paralysis of the leg. Atrophy very slight. Knee-jerks present and about normal; superficial reflexes over paralyzed areas wanting; no ankle clonus; temperature of right leg lower than left and skin quite dry. Being convinced that there was compression in the lumbar region, I advised operation at this time, but the patient refused. He was, therefore, put upon a course of massage and electricity. In November, 1889, he complained that the pain in the lumbar region running down the back of the right leg and foot was increasing, although his condition otherwise remained much the same.

In May, 1890, he concluded to be operated upon. At this time the thickening over the lumbar region had disappeared, and it was possible to make out a very slight depression at the third lumbar vertebra.

With a view to having my examination and conclusion corroborated,

are included in the unimproved class. Of the remaining cases, nine, 32 per cent., including the two cases that died after some months, were unimproved. Nine cases were improved, and of this number, one (McBurney's) is still under treatment and improving. Two, 7 per cent., are reported as cured.

In the antiseptic class there are four dorso-lumbar cases, two of which were fracture-dislocations in which reduction was almost impossible; in one as soon as the traction was removed the deformity was reproduced. Three of the cases died, both dislocation cases, one of which had other injuries that would alone have proven fatal; the third case lived four months and should consequently be included among the unimproved cases. The fourth case was not improved.

In the lumbar region, out of four cases in the old series, three, 75 per cent., died, and one made an incomplete recovery.

There are five cases in the antiseptic class in this region, and of these two died. In one the cause of compression was not found at the operation, and the second died of other injuries and should not be included in the death-rate, leaving only four cases to be considered, with 25 per cent. fatal. One case was improved, one was cured, and one showed no improvement. In this series I have to report the following case:

Man, aged twenty-nine years, Swede, engineer. On April 20, 1889, while on his hands and knees removing a block from under a gas generator weighing about two tons, the machine toppled over, the flange striking him in the back and pressing him down until it was arrested by an upright pipe which was fixed in the floor. He was unable to move from this position until the machine was raised. When he was pulled out he was laid on his back and "felt a queer sensation in his feet, which were numb." In a few minutes he began to have severe pain in the back, which was increased by motion, and had no control over his right leg. He was taken to Roosevelt Hospital. For the following notes of the case during his stay in the hospital I am indebted to Dr. Charles McBurney, who kindly placed them at my disposal. "On admission the spines of the upper lumbar vertebræ have a feeling of retrocession and there is also obscure crepitus, obscured by blood-clot beneath the skin."

During the next few days he lay on his side and retention of urine and of feces was a prominent symptom; the urine showed a large number of hyaline casts and albumin.

On the 27th, seven days after his admission, his bowels responded copiously to medicine, and it was found that he had no control over his rectum; the casts had disappeared from the urine.

"May 4. There seems to be paralysis of the extensors of the right foot. The patellar reflexes are responsive and apparently diminished.

"10th. The bed sore over the sacrum (due to feces irritating), which started ten days ago, is looking better.

"20th. Condition unchanged. Still catheterized. Movements of bowels are involuntary but conscious. Semi-paralysis of right foot. Temperature not taken. No pain except when patient attempts to roll

Automatic action.—There is imperfect control of the bladder and rectum. He has erections and has had connection since his injury, but there is no emission during the act.

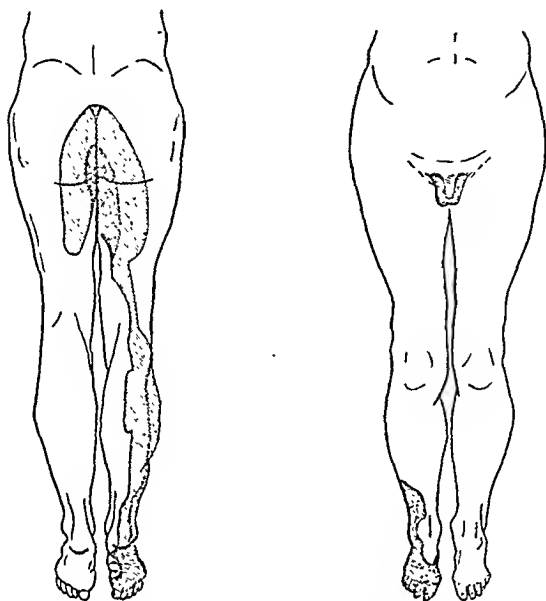
Diagnosis.—Injury and compression of the cauda equina at the level of the lower lumbar vertebræ.

He was also examined at this time by Dr. Robert Abbe, who concurred with the opinion expressed by Dr. Starr. On July 5th, assisted by Drs. Abbe, T. Halsted Myers, and C. E. Denison, he was etherized and the operation performed. An incision about seven inches in length, having the third lumbar vertebra as its centre, was made along the right margin and close to the spinous processes; the incision was carried rapidly down to the laminæ, where it became evident that there was an ununited fracture of the spinous process of the third lumbar vertebra. The spines of the second and fourth were cut off close to the laminæ with Liston's bayonet forceps, and the muscles were dissected back from the arches on both sides by means of a periosteotome. The severed spines were left attached to the flaps of the left side. The posterior arches of the three vertebræ were then removed by gnawing them off piece by piece with rongeur forceps, and we were able to make out a slightly depressed fracture of the right lamina of the third lumbar vertebra, which was surrounded by considerable callus, especially on the anterior surface. This somewhat diminished the size of the vertebral canal. A probe was passed in both directions in the canal to make sure no further compression existed either above or below the point of operation. A slight laceration in the dura, which was healthy and otherwise not opened, allowed the escape of some cerebro-spinal fluid. The hemorrhage, quite severe in the first two or three minutes of the operation, was controlled by compression with sponges and retractors. The wound was closed by means of deep and superficial catgut sutures, a drainage-tube being inserted at the lowest point of the incision, and the spinous processes were left attached to the left flap. The etherization occupied one hour and twenty minutes. There was practically no shock. The next day all pain had disappeared, and the dressing, which was soaked through, was removed and the drainage-tube withdrawn. There was some irritation in the bladder with retention of urine, and a bed sore below the original one, which had been threatening for some time, became fully developed. Five days later, however, the wound was healed and I was able to make a test of the anæsthetic area, which was slightly improved. The bed sores were better and he had less cystitis. On July 19th he was allowed to sit up. The subsequent course of the case showed simply a progressive improvement, until, at the present time, although still suffering from some paralysis and anæsthesia, he is able to remain at work for the usual number of hours, either running his engine or in the bottling-room of a soda-water establishment in New York. He has never worn any retentive apparatus and has never suffered inconvenience from the condition of his spine.

In seventeen of the cases the dura was opened and cerebro-spinal fluid escaped; six of these died. Of these six, one had a ruptured diaphragm with hernia of the stomach, etc.; another lived seven months, but the wound healed in about two weeks; one lived eighteen

I requested Dr. M. Allen Starr to see the case with me. The following is his report :

Examined by Dr. Starr, May 21, 1890. The man walks with much difficulty, dragging the right foot and being unable to raise it from the



Dark shading—area of complete anæsthesia.

Light shading—area of partial anæsthesia.

ground. The entire pelvis appears to be so displaced that the right hip is higher than the left. He has considerable voluntary power over the muscles above the knee, but those below the knee are almost completely paralyzed. He cannot turn or move his ankle or flex or extend his toes. The entire right extremity is smaller than the left, the difference being half an inch in the middle of the thigh and one inch in the middle of the leg. In the paralyzed muscles there is a complete loss of faradic reaction, and no response to interruptions of a galvanic current of ten milliamperes in strength. There is a loss of tone in the muscles paralyzed, they are flabby and have lost their mechanical excitability to percussion. The muscles are nowhere rigid or contracted.

Reflex action.—The knee-jerks are equal on both sides and normal in degree. There is no ankle clonus. Plantar reflex to tickling is absent.

Sensation.—There is complete anæsthesia of the penis, perineum, anus, and of a saddle-shaped area over both buttocks reaching down to within two inches of the popliteal fossa. On the right side the anæsthetic area extends downward over the back of the leg and over its outer side, and includes the entire foot, sole and front, excepting along the inner side, as determined by tests with cotton and with needles. The same area is insensitive to heat and cold. He complains of severe pain over the lower sacral region, and in this area there is a bed sore. The temperature of the right leg is perceptibly cooler than that of the left.

where displacement or crepitus indicates compression, and where extension directly after the accident clearly fails to reduce the deformity," provided there are symptoms present which indicate interference with the functions of the cord. In other cases I should wait until the shock following the injury had been overcome. During this time, however, the patient's condition should be most carefully watched, and at the first indication of any symptoms pointing to an extension of the interference with the action of the spinal cord, whether that interference be due to hemorrhage or to myelitis from compression, to callus, or to the exudation of lymph, the patient should be subjected to operation at once. It is of course unnecessary to say that no interference would be considered in any case where there was or seemed to be any amelioration of the patient's condition so long as that improvement continued.

Hutchinson,¹ in his conclusions based upon twenty post-mortem examinations, says: "Permanent compression of the cord or of any part of it is very rare, not more than one in ten, and as most fractures in this region are due to bends, fractures of the laminae are of little consequence and never cause compression. Instances of great displacement sometimes occur and can rarely be benefited by operation, while cases in which during life there is the greatest displacement are not always the most serious." He, in common with Legros Clark,² considers pyæmia and spinal meningitis the principal reasons for non-interference. "To weaken still further the remaining connection of a broken spine," says the latter, "to convert a simple into a compound fracture, to expose the sheath and possibly the cord itself to the risks attending the period of repair, cannot be regarded as matters of indifference." White³ sums up the possible dangers as follows:

1st. Disturbance of the cord is more or less involved in almost every form of operative procedure, and its exact importance is as yet unknown.

2d. The hemorrhage from the external and internal spinal plexus of veins.

3d. Laceration of the membranes, the risk of which accident would, of course, be increased if they were adherent to the bony walls of the vertebral canal.

4th. The danger from etherization, which is much increased by the prone position of the patient and by the paralysis of the abdominal walls.

Horsley considers sepsis the only real danger.

Chipault, as a result of a further experimental study of the points advanced by Hutchinson, comes to the same conclusion, but from a

¹ Clinical Record and Reports of London Hospital.

² British Medical Journal, vol. ii. pp. 49-52.

³ Annals of Surgery, 1889, vol. x. pp. 1-39.

days; and in one the cause of the compression was not removed. Three of the cases may be thrown out of consideration—leaving three, and one of these doubtful, that might possibly have been fatal in consequence of the escape of the cerebro-spinal fluid. Several cases, notably Duncan's¹ and Horsley's,² of spinal tumor, have illustrated the fact that the escape of this fluid may continue for a considerable time yet offer no obstacle to favorable progress. It has drained away in considerable quantities in cases of spina bifida that have been subjected to operation, and in several cases of tumor of the spine and of intra-dural section of the posterior nerve-roots.

Two conditions present themselves for consideration in deciding whether the operation should be done early or whether some time should be allowed to elapse. If undertaken at once, there is danger of interference where a spontaneous cure would result if the patient were left alone, or where a complete destruction of the cord renders any operative interference useless. If, however, operation be delayed too long and compression allowed to continue, a degeneration may result which would be as serious as though the functions of the cord had been destroyed by the original injury. This question of the selection of the proper time for operation is, therefore, a most important one. Lauenstein³ says: "If after the lapse of six or ten weeks there is incontinence of urine with cystitis or incontinence of feces, and especially if there is also the development and spreading of bedsores, but little is to be hoped from the unaided efforts of Nature." And Thorburn advances practically the same proposition in injuries to the cauda equina.⁴

In determining the influence of time upon the operation, there are fifty-one antiseptic cases where the time that elapsed between the injury and the operation is stated. Out of this number twenty-four died and twenty-seven recovered from the operation. Within the first eight days after the injury twenty-four of these were operated upon, with a mortality of twenty-one (all but three of the deaths) against three recoveries. In the non-operative cases it is also true that the greatest number of deaths occur within the first few days. In one of the cases the cause of death is given as myelitis reëstablished by the operative manipulation.⁵ It is impossible to draw any conclusion with regard to the effect of myelitis in the delayed cases from the histories I have been able to study.

From the result of my study of these cases I am inclined to agree with Horsley,⁶ that operation should be undertaken at once "in all cases

¹ Loc. cit.

² Trans. Med.-Chir. Soc., vol. lxxi. p. 377.

³ Centralblatt für Chir., 1886, No. 51, p. 888.

⁴ Surgery of the Spinal Cord, p. 162.

⁵ Pinkerton: Phila. Med. News, January 3, 1885.

⁶ Brit. Med. Journ., Dec. 6, 1890.

subsequent course of the case cannot be told from existing data. In one of McBurney's cases, in Page's case of Pott's disease, and in my case, the symptoms were increased for a few hours, and yet it is impossible to say how much of this was due to shock after the operation, and how much to disturbance of the cord. In Page's it is probable that it was due to concussion from the use of the mallet and chisel in removing the bone.

It is also probably true that the dangers of etherization are somewhat increased in cases where there is paralysis of any portion of the respiratory apparatus, but the only case reported in which this seemed to affect the result was Pilcher's, where the injury was practically hopeless.

Thorburn¹ in his *résumé* of the indications for operative treatment founded upon his sixty-one cases of fracture, says: "The operation of trephining the spine for traumatic lesions, as compared with the lesion it is intended to relieve, does not present any very great dangers and appears unlikely to increase the gravity of the prognosis, but as both *a priori* argument and the results of published cases show that it is unlikely to be of service, it should be abandoned, except in cases of injury to the cauda equina, and that in the latter, on the other hand, it will probably prove to be an eminently justifiable and serviceable procedure."

Adopting these views, we should condemn the 30 per cent. or more of cases that have been shown to be relieved under the present methods of operating, as compared with the statistics of Gurlt² and Burrell,³ to death, or to a miserable existence, without hope of relief. If, on the other hand, we do undertake an operation we increase the number of those improved 20 per cent., and add to the unimproved only 13 per cent. Horsley⁴ reports only one death out of nineteen cases of lamnectomy. We must conclude, then, that the procedure is not only justifiable, but eminently proper.

The operation is evidently contra-indicated in all cases where the patient has not recovered from the direct shock of the injury; where the cord is completely crushed or severed, whether by a simple blow from the displaced bone, which has sprung back to its place, or from direct and continued compression; in all cases where improvement has appeared early and is progressing; and, where a severe traumatic myelitis is still present or but just controlled. It is indicated, on the other hand, in all cases where improvement has ceased and the patient is still helpless, and where there is reason to think that the disability is due to compression rather than to complete degeneration.

It is essential in discussing this subject to fully appreciate the symptoms indicating compression or destruction of any part of the spinal cord. Interference with the voluntary action of the muscles places them

¹ Spinal Surgery, p. 161.

² Loc. cit.

³ Loc. cit.

⁴ Loc. cit.

clinical point of view we find that the cases of Cline, Laugier, Tillaux,¹ Maydl, Horsley, both of Jones's cases, Abbe, Jaboulay, Pilcher, and McCosh, apparently fulfil these conditions, while those of Mayer,² McDonnell, Maunder,³ Lucke,⁴ Halsted, Lauenstein, Hardie, Duncan, Péan,⁵ Abbe, Jaboulay, Dawbarn,⁶ Wyeth, and my own, show that the bone either did not spring back to place, or that the depressed laminæ were the compressing factors. It is clear, from a clinical standpoint at least, that the statement made by Hutchinson, with regard to the bone as the compressing agent, is too radical; for out of thirty-five cases, fifteen more than Hutchinson reported, in which the cause of compression is given, we find eleven due to temporary, and thirteen to continued bony displacement.

In four cases the compressing cause is stated as extravasation of blood (Oldknow,⁷ G. W. Jones,⁸ Stephen Smith,⁹ and Willett¹⁰), and Pilcher's, in addition to the crush of the cord, had two extra-dural hemorrhages, a condition which Hutchinson said he had never seen "to the extent of possible compression, and in the majority of cases little or none."

Of the objections of Legros Clark little need be said. Antisepsis, with its improved technique and more careful observation and treatment of operative wounds, has swept away the dread of septic infection; we have already proven that a free incision of the dura mater has little or no effect upon the result, and so far there are only two cases in which it has been necessary to apply a plaster-of-Paris jacket at any length of time after the injury. In my case with the posterior arches of three lumbar vertebræ removed, the man has returned to his work and is able to do an ordinary day's labor. Morris's case, too, which died ten months after the operation, was found to have a dense mass of fibrous tissue filling in the place from which the bone had been removed; and Page,¹¹ in a case operated upon for Pott's disease, reports that the site of the removed arches was apparently filled with solid bone.

There can be no doubt that disturbance of the cord is more or less necessary in all operative cases. How much effect this has upon the

¹ Bull. Gén. de Thérap. Méd. et Chir., 1866, p. 202.

² v. Walther and v. Ammon: Journ. der Chir., Bd. xxxviii.

³ Lancet, 1867, vol. i.

⁴ Werner: Die Trepanation der Werbelsäule, Strassburg, 1879; Rev. des Sci. Méd., April, 1880.

⁵ Brit. Med. Journ., 1888, vol. i. p. 672.

⁶ N. Y. Med. Journ., June 29, 1889, p. 711.

⁷ Cooper's Fractures and Dislocations, 1822.

⁸ Med. Times and Gaz., 1856, vol. ii. p. 86; Brown-Séquard: Dis. Central Nervous System, p. 255.

⁹ Phelps: N. Y. Journ. Med., vol. vi. p. 87.

¹⁰ St. Barthol. Hosp. Reports, vol. ii. p. 242.

¹¹ London Lancet, Dec. 1890, p. 1210.

the segment. If neither of them is found alone the segment is probably diseased. In crushed injuries the limbs are flaccid, the tendon reflexes abolished, and there is ankle clonus and rigidity."

In all cases the motor paralysis and anæsthesia will vary with the location and extent of the spinal lesion, but, as a rule, both are present to a greater or less degree. If, now, we have a complete motor and sensory paraplegia below the distribution of the nerves arising in the segment above that involved in the injury, with paralysis of the rectum and bladder, abolition of the reflexes whose centres are below the level of the injury, with rapid atrophy of the muscles, which are also flabby and relaxed, and which give the reaction of degeneration, the probabilities are that there is a total destruction of the cord. If the reflexes are present and controlled or exaggerated; if the atrophy is gradual and not very great, due to lack of muscular exercise, even though there is more or less trophic disturbance, anæsthesia and paralysis, and the reaction to the electric current is arrested in the paralyzed areas, the probabilities are that there is compression, rather than destruction, of the cord.

The methods of operating have varied with different surgeons. Cline, in the first case, made two parallel incisions on either side of the spinous processes, and then, having retracted the muscles, removed the spines before attempting to cut through the arch. Horsley makes a similar use of the double incision and then makes a cut at right angles to the first through the lumbar aponeurosis and muscles. This subcutaneous incision is placed about the centre of the field of operation and is employed to increase the retraction of the flaps. Bullard and Burrell and Dawbarn have employed an H incision, placing the two arms of the H in the vertebral grooves perpendicular to an incision carried across the median line at the point of greatest deformity. Demons used a V-shaped incision, the arms of the V passing on either side of the vertebral column. Morris employs a crucial incision, but the majority of the operators have employed the two parallel incisions. Abbe uses a single incision on one side and close to the spinous processes, cutting them free from the laminae and leaving them attached to one of the flaps. I prefer this method of operating because it occupies less time, causes less hemorrhage, and can be completed without disturbing the interspinous ligaments. The hemorrhage must be a matter of careful consideration, since it is for a few minutes usually copious and very general. The incision should be carried at once and very rapidly down to the laminae, and then the wound should be packed firmly for a minute or two. This will arrest the bleeding in great part and will enable the operator to see and ligate any arterial branches that may continue to spurt. The flap on the side of the spinous processes with the incision can then be dissected away from the arch until the articular and transverse pro-

entirely under the control of the reflex centres in the cord, causing the affected limbs, owing to the difference in strength of the various groups of muscles, to take certain well-defined positions.

In regard to position, Starr¹ says: "If the lesion is near to and below the third lumbar segment and irritates it, but does not destroy it, the patient is likely to lie with the thighs drawn up and the legs flexed. If the lesion is above the third lumbar segment he will lie with the thighs and legs extended, unless the lesion produces great irritation, as in the last stages of lateral sclerosis, when the thighs and legs are flexed and adducted. If the lesion is about the two lower cervical segments and irritates the fifth and sixth, he will lie with his arms abducted about at a right angle, his forearms flexed on the arms, and hands supinated or their position dependent upon gravitation, and fingers flexed. If the lesion is about the middle cervical segment as high as the fourth, the arms will lie at the sides and cannot be moved." Bowlby² has observed the condition of the reflexes in twenty-one cases of cervico-dorsal fracture, all but one confirmed by autopsy; in the other twenty cases, where there was a complete transverse destruction of the cord, there were no reflexes nor rigidity of the muscles. The superficial reflexes were also generally lost immediately after the accident, although this was not always true. Unlike the deep reflexes, too, the superficial reflexes may return. "On the other hand, when the cord has been injured and when it is compressed, but when its continuity has not been entirely interrupted, the reflexes are not only preserved, but may be, and generally are, exaggerated." Bastian first made this observation as early as 1882, and again in a recent paper.³

As a result of this investigation Bowlby says: "Where there is a complete loss of deep reflexes there is probably a total transverse lesion; but when these reflexes are present the cord is certainly not completely crushed." "If the exaltation of the reflex power," says Tillaux, "has been considered as a sign of destruction of the dorsal or cervical cord, I think that the absolute abolition of these reflexes in the cases of fractures in the lumbar region would be generally an indication of the destruction of the medullary substance. I consider, therefore, that the persistence of the reflex action in lumbar fractures would be a favorable sign and its abolition an unfavorable one."

Starr says: "Examine for an area of anæsthesia corresponding to the sensory nerve, along which the impulse is carried to the segment, or for a condition of paralysis with atrophy and reaction of degeneration in the muscles supplied by the nerve which conveys the impulse from

¹ Familiar Forms of Nervous Disease.

² Med.-Chir. Trans., 1890, vol. lxxiii. p. 313.

³ Ibid., p. 151.

convinced that this end has been attained. In three cases—in one of Bridden's and in Demons' and in Kraske's—of Pott's disease, the compression was found at the autopsy to have been under other laminæ than those resected.

Chipault advocates the omission of a drainage-tube in every case where the dura has been opened, but I prefer even in these cases to drain away the considerable quantities of serous fluid that are exuded during the first few hours, placing a suture in position, however, to bring together the portions of the flap separated by the tube when it is removed. Deep and superficial sutures should be used in approximating the flaps.

In case a sinus occurs, or it is necessary to continue the use of the drainage-tube, and there is an escape of cerebro-spinal fluid, the skin about the orifice should be kept greased to prevent the contact of the escaping fluid, for it has been observed in every case where this fluid has drained away for any period it has caused excoriation of the skin.

In operating in the cervical region, particularly about or above the level of the fourth vertebra, care should be exercised not to puncture the cord. In Deaver's¹ case this precaution was not observed, and the patient died from inhibition of the phrenic nerve.

Eve² says that the operation, if not almost impracticable, is certainly one of the most difficult in surgery, but this is not borne out by present experience. The operation in itself is neither tedious nor difficult.

THE ETIOLOGY OF EMPYEMA IN CHILDREN:

AN EXPERIMENTAL AND CLINICAL STUDY.

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THE first aspiration and exploratory puncture of the pleural cavity was performed by Bowditch, the American physiologist, and from this bold innovation upon the former methods in vogue may be traced our decided advances in the treatment and proper understanding clinically of the pathological conditions of the pleura. In his address before the Tenth International Medical Congress, Sir Joseph Lister in speaking upon empyema said: "There are few more beautiful things in antiseptic

¹ Internat. Journ. Med. Sci., Dec., 1888.

² Ashhurst, Int. Ency. Surgery.

cesses are in full view. The spinous processes can then be cut away at their bases with Liston's forceps, and the flap on the opposite side, including the spinous processes, can be dissected away in the same manner as the first.

The methods of removing the laminæ have differed very materially. Bullard and Burrell used a surgical engine, which, with the usual facility of most of these labor-saving inventions in surgery, broke down at the critical moment, and the removal was completed by means of an osteotome. The trephine and Hey's saw are also used. The reason given for the employment of these devices is that buttons of bone can be preserved and replaced. In Page's case of Pott's disease, where the mallet and chisel were employed, every blow of the mallet caused involuntary muscular twitchings in the limbs, and consequently may have been the cause of the increased symptoms exhibited by the patient after the operation. So far as the replacing of the bone is concerned, I do not think it has any important bearing on the subsequent course of the case. In fact, so far, only two cases—Thompson's and McBurney's, unless we also include Page's—in which the tubercular disease in the body of the vertebra was not removed, have required the application of any apparatus to strengthen the spine. In the latter the site of the operation is reported to have filled in with bone. It seems to me much more satisfactory, both as regards time and the saving of concussion, to employ the rongeur forceps to remove the laminæ; and for this purpose several different pairs should be provided, a straight pair being especially useful. It is best in every case where the cause of the compression is not found to be extra-dural, to open the membranes and ascertain if there is any difficulty between them and the cord. When this is done, Mr. Horsley says, "the anæsthesia should be very profound, because the dura is extremely sensitive, and any motion at this time might prove fatal to the operation." There can be no doubt but that the anæsthesia should be complete. The danger of causing involuntary muscular action has been proven, by Abbe's case of nerve-section, where the dura was opened without any anæsthetic, to be due rather to irritation of the posterior columns of the cord than to the sensitiveness of the dura.

When the membranes are opened they should be closed very carefully by means of fine catgut. Some operators have not stitched the dura, but in view of the irritating qualities of the cerebro-spinal fluid this precaution to prevent a fistula should be taken.

Care should be had to ascertain at the time of the operation that the cause of the compression has been found and removed, and for this reason I believe it is best to explore the canal above and below the opening with a probe, being careful not to injure the dura. It may be best to remove more laminæ in some cases, in order that one may be

microorganisms in the subpleural tissue, even in subjects who clinically cannot be said to be suffering from any active disease. In the course of investigations upon empyema, the question has arisen whether an effusion into the pleural cavity might from the very onset be purulent; those of experience answer in the affirmative. In children especially we are apt to think that an effusion is serous, or rather non-purulent, if the exploratory needle gives what to the eye appears a clear, not turbid fluid. The inquiries into the pathology of these cases show that those acute cases showing a serous exudate which subsequently becomes purulent are really at the time purulent (from the beginning, in the most modern acceptance). To return to our first premise, though Weichselbaum has distinctly shown, in lobar and lobular pneumonia of the adult, that the streptococcus pyogenes and also the staphylococcus are present as so-called mixed infections, yet when we come to consider the exclusive presence in the exudate of empyema of these microorganisms there is a gap to be explained which, as far as we know, has not yet been clearly elucidated.

In another group of cases Fränkel found the exclusive presence of the pneumococcus or diplococcus pneumoniae; this microorganism was found in pure culture in the exudate derived from the pleural cavity. The pus was of a thick, adhesive character, and the cases of this group are classed as post-pneumonic or concomitant with pneumonia (lobar pneumonia). Fränkel maintains that in these cases suppuration is maintained in the presence of a closed pleural cavity by the presence of bloodvessels with the existence of a different nutritive medium than in the artificial structures.

The third group of empyemas are those whose nature is tubercular. In all these cases he could not establish the presence of tubercle bacilli, for some baffled all the aids to diagnosis of this microorganism, both in plain stain, culture, and experiment. Fränkel has come to the conclusion that the absence of any result as far as stain and culture were concerned, in the study of exudates, pointed very strongly toward a tubercular element in the etiology of the empyema. Garré and Rosenbach in experimenting with the pus of cold abscesses had a similar result. Fränkel found tubercle bacilli by staining methods in only one case of four investigated; in the others the results were negative.

There is, according to this author, a fourth group of cases, in which we can find a focus of infection situated outside of the pleural cavity. He had two such cases, in both of which the chain-coccus was found, and one of which followed a perforating peritonitis, the other a retro-pharyngeal abscess. The conclusions of this author relating to empyemas are that the presence of the chain-coccus or streptococci, or staphylococcus pyogenes is not diagnostic. The presence of the diplococcus pneumoniae points to a preceding pneumonia or complicating

surgery, as contrasted with the results of former practice, than to see the abundant purulent contents of the pleural cavity give place at once to a serous effusion, rapidly diminishing from day to day." Surgery has therefore been in advance of pathology, and it was reserved to a very recent period for some enlightenment upon the nature of empyema and pleurisy to appear, and supplement the surgical advance in this department of medical learning.

This advance has been made through the avenues of modern bacteriological methods. I am certain that with the light thus thrown upon the nature of empyema in the adult, the diagnosis and understanding of this disease will have received incalculable aid, and the future treatment in both surgical and medical directions will be based upon more certain data than hitherto. I think we have passed that stage which justifies the general grouping of all suppurating pleural processes as empyema without modifying this term so as to point out at once the etiology. If the above is true of the adult, we would naturally expect the same phase of this question when applied to children. Though we have many of us taken for granted that what was true of the adult might be equally so of the infant and child, it has been the object of the author of this paper to make such an inquiry in exact channels, as had been done by others concerning the adult. The literature upon the etiology of empyema in the adult is not so very extensive, if we regard those works only which are really systematic, and therefore of satisfactory merit. The first complete contribution, an attempt to formulate the different varieties of empyema from a bacteriological standpoint, was that of A. Fränkel.¹ This paper contains the result of a series of studies extending back as far as 1886. The author divides empyema into the following groups:

Those in which the etiology is still a matter of speculation. In these we cannot point to anything positive, because both the clinical history and bacterioscopic examination of the purulent exudate give no support to any definite theory. In these cases the exudate upon examination fails to yield anything but a microorganism which is found in processes of diverse nature in the body. From the chain-coccus, or streptococcus pyogenes, we could with much justice presuppose an antecedent pneumonia; we might follow this chain-coccus in its migrations through the lymph-channels of the pulmonary pleura; but, on the other hand, there are authors who, like Fraentzel, believe in the occurrence of a "pleuritis acutissima." Unfortunately, this disease described by Fraentzel is of most rare occurrence and doubtful etiology. Traumatism or cold have been invoked in these cases as predisposing causes which allow such microorganisms as streptococci to act upon the economy by reducing its resistant vitality. We must here presuppose the continued presence of

¹ "Ueber die bakterioscopische Untersuchung eitrige Ergüsse," Charité Annalen, 1888, p. 147.

from the clinical history and physical signs that there was a probable existence of empyema, the chest of the patient was carefully cleansed with soap and water, and then with sublimate; the excess of antiseptic fluid having been removed, a clean and sterilized hypodermic needle was introduced into the chest. To avoid contamination, a new syringe was used for each case, for it is very difficult to be certain as to the cleanliness of a syringe which has been once used for pus. The ordinary hypodermic syringe was used after being cleansed with sublimate, alcohol and ether, and then sterilized distilled water. The needle was sterilized with heat in the dry oven at a temperature of 160 to 170° C., kept in a sterile test-tube and only put upon the syringe at the last moment. A specimen of the contents of the pleural cavity once withdrawn was placed in an empty sterilized test-tube and taken as soon as possible to the laboratory and examined. The examination included not only the study of the gross specimen, the preparation of crude pus upon cover-glasses in the ordinary way, and then stainings of the crude pus, but plates and cultures were made upon media to establish the bacteriological character of the fluids withdrawn. The media used for culture experiments were bouillons, gelatin, glycerin agar, agar-agar, Weichselbaum's agar;¹ blood-serum and potato plates were first made to obtain colonies, as also test-tubes prepared by rubbing the fluid to be examined upon the obliquely solidified media, as agar (Weichselbaum); and pure cultures were also obtained from the plates, and if growth occurred in the tubes, plates were made to test the purity of the growths. Re-inoculations upon other media were made; when pure cultures were obtained, these were injected into animals for experiment. The animals used were rabbits, guinea-pigs, rats and mice. The most uniform results were attained from the rabbit experiments. The microorganisms were taken from a pure culture from an agar tube and suspended in sterilized distilled water, or, mostly, a pure bouillon culture was directly injected. The injections upon animals and autopsies were performed with the ordinary precautions followed in the bacteriological laboratory.

The characters of the crude pus withdrawn from the various cases are of interest when considered in relation to one series of cases, namely, those in which the *diplococcus pneumoniae* of Fränkel and Weichselbaum was present. In some of this set of cases, the pus seemed of a rather glutinous adhesive nature; it would adhere to the sides of the test-tube when the same was inclined; this pus was either creamy-white in color, or greenish, or greenish-yellow. In these cases the chest was sometimes filled with enormous elots of fibrin, which were expelled from the opening

¹ By Weichselbaum's agar is meant the agar recommended by this author, containing 1½ per cent. of agar, peptone, and grape sugar, with ½ per cent. of salt.

pneumonia. An exudate which fails to yield any positive result either by stain or culture is in all probability tubercular.

Weichselbaum's name is also indissolubly connected with much good work in this field. He examined eleven cases of pleuritis.¹ Two of these cases were of a purulent and one of a sero-purulent nature, the remaining eight were serous. In the empyemas he found the streptococcus pneumoniae, or what we may call streptococcus pyogenes, and in another case, which proved fatal, the diplococcus pneumoniae was found. About this time, Fränkel published² two cases of empyema following pneumonia, in which he found the diplococcus pneumoniae.

The above historical review would be incomplete without the mention of the important work of Ehrlich in the study of pleuritis.³ He investigated by staining methods the bacterial character of fluids obtained from the pleural cavity in forty-five cases of pleurisy; of these, nine were tubercular, twenty simple pleurisy, six carcinomatous, and nine empyemas of various kinds. Of nine tubercular cases in which the sputa of the patients contained tubercle bacilli this microorganism was found in only two. The negative result in the remaining seven does not by any means prove the absence of tuberculosis of the pleura.

The work upon empyema in children is, in contrast to what has been recorded of the adult, limited to a few scattered notices in the literature. The most important is found in the work of Rosenbach, who examined the exudate of a case of empyema and found the micrococcus tenuis (pyogenes), or what is now thought might have been the diplococcus pneumoniae, present.

The recent articles of Von Ziemssen ("Vorträge") and Liebermeister are simple literary *résumés* upon the subject.

ORIGINAL INVESTIGATION.—My own work upon empyema was framed upon the lines outlined in the above review. An attempt was made to see how far the results in children, from a bacteriological standpoint, would correspond to those attained in the adult, or whether they would differ. In June of last year, I reported in brief my results in twelve cases; there are three additional cases to report, in one of which at least some interesting points will arise. The work done was upon material which at the time, for the most part, was in a hospital ward, evidently an advantage. The mode of bacterial study was in accord with what is practised by the Koch school of investigators. Some of my cases were taken from my dispensary class; others from private practice or those of my friends. It being established both

¹ "Ueber die Etiologie der acuten Lungen- und Rippenfellentzündungen," Medizin. Jahrbücher, 1886, Heft 8, p. 483.

² Zeitschr. für klin. Med., 1886.

³ Beiträge zur Ätiologie pleurit. Ergüsse," Charité Annalen, 1882, p. 207.

like reticulum. If such a surface culture be examined after successive re-inoculations, it is made up of very minute transparent punctate areas or colonies; as a whole, the growth does not attract the eye by any particular hue. If a puncture culture, as it is called, is made on agar, the area around the top of the puncture is very minute and scarcely perceptible. Colonies from pus sown upon agar-agar plates are at first so small as to be discovered only by the aid of a lens; they never attain a very large size, and are situated in the depth of the medium, and inoculated by means of the platinum point only with the greatest difficulty. The reason of this seems to be that the microorganism is so delicate that not enough adheres to the platinum tip to favor growth in the test-tube. The colonies after forty-eight hours are round, granular, with a darker centre, some of them, than periphery; they are of a transparent very light grayish tint or straw color by transmitted light; when the plate with colonies is held against a dark background, the reflected impression is that the colonies have a whitish tint. Unless this microorganism is transferred very early during the first few days to other tubes, it stops at a certain point and ceases growing—in other words, it may be lost. The colonies, especially in four or five days, begin to die out, becoming fainter to the lens and taking on the color more and more of the surrounding agar. The above applies to the diplococcus in pure culture derived from pleuritic fluid. After inoculation into animals, the growth, though the same in all essentials, seems to have attained a greater vigor, though even here, if not saved by repeated re-inoculations upon media, it dies out quickly.

Gelatin.—In gelatin, at the ordinary room temperature, there is no growth; at the temperature of 23° or 24° C. there is a very delicate growth which never becomes vigorous; along the puncture there is a granular minute beaded structure, but of the greatest delicacy, and the gelatin is not fluidified.

Blood-serum.—The growth here is much the same as on agar-agar of Weichselbaum, though the colonies making up the surface culture may be said to be more grayish in tint, or slightly more perceptible than upon the agar.

Bouillon.—Here there is first a general clouding of the medium, and then a deposit of flocculi along the sides of the tube, and finally a small deposit in the bottom of the test-tube, leaving the fluid or bouillon above finally clear. When shaken, there is great turbidity and abundance of fine flocculi.

Potato.—There is here no perceptible growth.

Ordinary agar.—It is certainly a waste of energy to attempt to cultivate the diplococcus successfully upon ordinary agar, for failure will be the most frequent reward. In other words, much valuable time has

made by resection of the rib. The pus also in some cases separated in a serous and opaque greenish layer upon standing; in other cases, as in greenish pus, the same had no adhesiveness. I mention these facts, because Fränkel has pointed out the adhesive or glutinous nature of the pus withdrawn from the adult cases, and the same characters in similar cases were easily established in children. In none was a foetid odor perceptible, either in the pus derived from the cases in which the diplococcus pneumoniae was present, or in those in which the streptococcus or staphylococcus pyogenes was found. Primarily, none in the series I have examined were fetid. In two cases the pus became fetid after the chest had been opened, and these cases, both of diverse nature, I will attempt to explain later. In all cases the crude pus was spread upon cover-glasses and stains made both for tubercle bacilli, diplococcus pneumoniae, and other microorganisms; care was taken to follow out a routine in each case by which tubercle bacilli (Ehrlich's stain) could be excluded. In those cases in which the capsule cocci were found by simple stains with methyl or gentian-violet, the resistance to Gram's discolorization was tested.

For the sake of simplicity, we can formulate results in the following manner: In the pus of the fourteen recorded cases, I found the following microorganisms:

The streptococcus pyogenes.

The staphylococcus pyogenes aureus.

The diplococcus pneumoniae (Fränkel and Weichselbaum).

The tubercle bacillus (Koch).

In few of the cases did I find these microorganisms associated, but usually existing alone in a specimen of pus. The tubercle bacilli were found associated with the streptococcus, as I shall later explain. It was certainly striking, at least in my series of cases, that the organism found existed in the fluid withdrawn from the chest in so-called pure state. The pus was really equivalent to a pure culture of one of the microorganisms. It would be tiresome and of little value to go into detailed description of the staphylococcus pyogenes aureus and streptococcus pyogenes found in my cases, and it will suffice to say that they are in culture media, and when injected experimentally acted in a way exactly corresponding to all that is known of these microorganisms.

THE DIPLOCOCCUS PNEUMONIAE (Fränkel and Weichselbaum).—When the pus from an empyema is rubbed upon the surface of an obliquely solidified tube of agar-agar of Weichselbaum, and placed in a temperature of 35° to 37° C., there appears within about six hours a thin, almost imperceptible coating very much like dew on the surface of the agar; within twenty-four hours this is more marked, though it is still very delicate and veil-like, and does not seem to grow vigorously. In the depth of the agar, if the same has been inoculated, there is a delicate veil-

reacts in media exactly similarly to the ordinary streptococcus pyogenes. In agar-agar plates the colonies remain small but some large, some irregularly round, others oval of a brownish-olive tint and granular appearance. In punctures the finely beaded dots and zone surrounding the top of the puncture exhibit no tendency to spread to any extent; on the surface of obliquely solidified agar a pearly-gray growth is seen (Weichselbaum's agar) made up of drop-like masses in the depth; the same beaded appearance in either a band or puncture that is seen in ordinary agar.

Gelatin.—Small finely granular colonies, at first straw-tint and sharply round, later more brownish with an olive tendency. At border, through gelatin, they appear straw-color, on surface of gelatin they have a distinct cupola (raised); they grow in depths also. In punctures, finely granular, no liquefaction of gelatin.

Bouillon.—In twenty-four hours we have a cloudy appearance, and deposit of masses on sides of test-tube, finely granular in the centre. Stainings show exquisite chains.

Potato.—Nothing characteristic or perceptible.

EXPERIMENTAL.—The experimental part of my work was laid out upon very simple lines, and is intended merely to add confirmatory evidence upon the nature of the microorganisms which I have isolated from the various cases of empyema reported. The results attained, it will be seen, are almost identical with those obtained by other observers (Fränkel and Weichselbaum).

My method consisted first, in isolating microorganisms so as to obtain a pure culture of each variety, and then injecting this pure culture into the animal to be experimented upon. The animals used were mostly rabbits, but a few scattering experiments were performed with guinea-pigs, rats, and mice. The injections were made with sterilized hypodermic needles underneath the skin and into the pleural cavity or lung. There were no inhalation experiments. A pure culture of any microorganism having been injected into the animal, the same was observed, and if the animal survived, it was, after a sufficient period had elapsed, killed and pathological effects noted. If the animal died from the effects, the blood, and the pleuritic, pericardial and peritoneal fluids were examined, and the nature of the contained microorganisms established in exactly the same manner as had been done with the original pus obtained from the empyema. Re-injections of these pure cultures from animals were made, as also injection of pleuritic and peritoneal fluids from animal to animal. Pus in crude state from empyemas was also injected into animals, and the microorganisms cultivated from the blood and fluids of such animals.

The most interesting series of experiments in their results were those performed with the pure cultures of the diplococcus pneumoniae. In every case the isolated microorganism was injected into a set of animals,

been wasted by others as by myself in making such attempts. The least variation in moisture or reaction will compromise the growth, so that I have worked mostly with the agar-agar of Weichselbaum, rather than with that made up by the old formula.

Glycerin agar—six per cent. to eight per cent.—did not seem to present any advantages. The growth was very slow and difficult of re-inoculation, and capricious.

Stainings.—The crude pus shows us the diplococcus with its capsule. I have had no difficulty in establishing the presence of the capsule coccus by means of the simple methyl-violet or gentian-violet and aniline water stain, taking care not to over-stain. If the specimen should have been over-stained, it can be easily decolorized (but this very lightly) with dilute alcohol. The pure culture shows the diplococcus from agar very beautifully, as oval or round diplococcus forms of apparently the size seen in the crude specimen without any capsule; the diplococci may be single or in chains of two or three pairs. By the Gram stain there are also seen both in the crude pus and crude culture some of the peculiar lancet-shaped forms; while I could find here and there a beautiful lancet form, there were many which upon analysis appeared peculiarly crenated, perhaps due to either unequal decolorization or overheating. The capsules in the crude specimens are decolorized by the Gram method, though the light decolorized zone of their presence may be seen by strong and favorable illumination in some cases.

THE STAPHYLOCOCCUS PYOGENES AUREUS which was met in these empyema cases could in no way be distinguished from the staphylococcus which I separated and cultivated for comparison from the ordinary furuncle of the skin. It reacted in the same manner in the various culture media. In the gelatin it grew at the ordinary room temperature along the puncture and had the same yellow-gray or straw-color beaded look. The gelatin, after the third or fourth day, became liquefied; this began at the top and proceeded along the puncture in length and breadth. After a time the liquefied gelatin showed the finely granular suspended colonies, and the sediment at the bottom of the liquefied gelatin took on the same orange-yellow color.

Agar-agar.—Upon obliquely solidified agar there was at a raised temperature a very vigorous growth on the surface, and in the depth, which, at first whitish-yellow, after a time assumed a rich orange-yellow tint; the surface of the growth was moist, and its edges sinuous and raised very perceptibly above the surface.

Potato.—The well-known orange-yellow moist growth was perceptible within twenty-four hours, increasing in vigor and luxuriance; it was at first golden-yellow, then deeper orange-yellow, having the peculiar odor of the ordinary culture of staphylococcus.

THE STREPTOCOCCUS which I have isolated from cases of empyema

animals seemed to have successfully resisted the effects of the micro-organisms, for upon autopsy nothing was revealed that could be traced to any pathological process.

Experiments with the streptococcus which was isolated from the pus of the empyemas recorded in this paper, and which appears to be identical with the streptococcus pyogenes, though positive in some features were yet not so distinctive. The results seemed to vary, for while in some cases streptococci did not prove fatal, in another the effects seemed most virulent and rapidly lethal. In some, injection of streptococci into rabbits had no effect, the animals survived, and being killed after weeks had elapsed, absolutely nothing abnormal was found. In other cases streptococci (from the same empyema) caused marked disturbances; the animal appeared quite ill, but recovered and was for weeks apparently in good health; when killed, a few pleuritic adhesions only were found.

In other cases, an injection of a pure bouillon culture of streptococci, notably in rabbit 15, taken from Case XI., caused the death of the animal in two days, and autopsy revealed nothing but an enormous spleen (the largest I have seen in my experiments) with kidneys palpably swollen; cultures of the blood revealed streptococci. Thus, in this case, we have the symptoms of a pure septic effect, a septicæmia without inflammatory lesions. Again, this same bouillon culture, which was pure in every way and repeatedly tested as to purity by plate methods, was injected at the same time into another animal in the same amounts, though not in the same manner, and there resulted the unusually virulent effects seen in rabbit 16, in which small metastatic abscesses appeared in different organs of the body, and general jaundice. The spleen also was notably enlarged. The results, though corresponding in certain ways, do not give anything not characteristic of streptococci isolated from other inflammatory processes in the body, and the experiments upon rabbits 15 and 16 agree closely with what is recorded of experiments made with streptococci pyogenes isolated from cases of pyæmia, and notably that of the kind recorded by Baumgarten.

I did not make any experiments with staphylococci isolated in my cases, the reactions of the microorganisms being so familiar in every laboratory. It appeared to me sufficient to establish its biological identity.

The experiments with the pus obtained from the cases of tuberculous empyema were negative. The pus was contaminated at first with streptococcus pyogenes and later with putrefactive microorganisms, and this eluded the reliability of the experiments. Injections into the eyes and pleuræ of animals gave no results that were of scientific value.

(To be continued.)

and the results have been noted. After the first effects of the injection had passed off (chest injections into pleura), the animal in some cases seemed to be as well as ever, but after a few days, varying in different cases, the animals in most cases died. Death was, as a rule, preceded by a short period of dyspnoea, or again the animals may have appeared ill through the whole experimental life. The autopsies revealed in most cases pleurisy single or double, even though injection was made into one side of the chest. The lungs in no case were the seat of complete hepatization (pneumonia) lobar in distribution; but in rabbits 1, 3, 6, 9, and 11 there was a condition of the lung not dissimilar to an engorgement in areas to smaller or greater extent. In rabbit 6 this approached closest the type of hepatization in the upper lobe of the left lung. Pericarditis was present in most and also very marked peritonitis. Care was in all cases exerted to inject the fluid containing the microorganism just beneath the rib into the pleural space, though it was often impossible to say that it had not penetrated the lung; at least care was taken that it should not do so.

In most of the cases the spleen was enlarged to palpably twice or thrice its original size. Cultures made of the blood and pleuritic or pericardial fluids of such animals also yielded a uniformly certain growth of a diplococcus which in every way and reaction corresponded to the diplococcus pneumoniae of Fränkel and Weichselbaum. Its growth was at first quite vigorous on the Weichselbaum agar, but it died out and was soon lost if not re-inoculated, just as the original pure culture obtained from the empyema pus. Animals injected with the pleuritic or peritoneal fluid of other animals that had died of injection of pneumococcus also died certainly and even rapidly. The lung and spleen fluids (obtained by expression) with cover-glass stain also showed myriads of these diplococci. By the injection of pure cultures of diplococcus underneath the skin, the results were not so certain, though in some the animals died with the above features. The pus from empyemas known to contain nothing but diplococcus pneumoniae also killed the animals with unfailing certainty; cultures made from these animals revealed the diplococcus only, and injections of peritoneal fluids from these animals into others proved fatal with results showing pneumonia, pleuritis, pericarditis, and peritonitis, and in all the fluids of such animals, inclusive of the blood, the diplococcus was found. In some cases the animals would seem to have had vitality enough to have resisted this organism, and completely recovered from the effects of their injections and consequent inflammatory disturbances. Such animals were killed after a sufficient period had elapsed, and in most cases there could be seen adhesions of the pulmonary to the costal pleura, and adhesions of the pericardial surfaces. Some guinea-pigs injected gave results much the same as those seen in rabbits. In other cases the

This demonstration of the greater prevalence of erysipelas in New York during the cold and moist seasons of the year agrees with the results obtained by the majority of investigators who have given attention to the subject in other countries. Carl Haller's statistics, based upon ten years' study of erysipelas at the Vienna Hospital, show the greatest number of cases in April, May, October, and November. Kaposi's observations, carried out over a period of two years and published in 1887, show the largest numbers in March, May, November, and December of one year, and January, February, April, May, and December of the other.

To quote a recent observer, Linden, of Finland, whose study of the question extended over a period of eight years and embraced over 5000 cases, found 27.1 per cent. in the winter, and 20.4 per cent. in the summer months for Stockholm, and 29.2 per cent. in winter with only 18.8 per cent. in summer for Helsingfors: an appreciable difference, though not so marked as that shown in the Charity Hospital record.

The most plausible explanation seems to be the sudden and decided variations in the temperature and moisture of the atmosphere in these seasons, but whether these factors influence the outbreak of the disease by weakening the patient's powers of resistance to the erysipelas coccus or by favoring an increased production or increased activity of the microorganisms outside of the human body is a question which must remain for future solution.

The relative frequency of facial erysipelas is another point made prominent in my tables. Thus of the 419 cases at Charity Hospital 267 were of the facial variety, or 63.7 per cent.

It is quite remarkable to note that of the 531 cases in Kaposi's statistics 336 were facial, or 63.27 per cent., almost an identical percentage.

The table of my personal cases shows, out of a total of 47 cases, 24 instances of facial erysipelas, or about 50 per cent. Of these 18 were so-called genuine facial cases, and 4 were consecutive to trauma or skin disease. Erysipelas of the extremities gives 23 cases, 19 of which followed trauma or skin lesions. There were no deaths from the facial erysipelas, and only 3 from other forms, or 6.4 per cent. The deaths all occurred in infants; one at five months following varicella, and the two others at three weeks of age respectively, both the result of ritual circumcision done in a bungling manner. Forty-two cases were cured after an average length of treatment or duration of the erysipelatous process of 7.57 days. Two cases passed from observation.

The tables of the Charity Hospital cases show 21 deaths, or 5 per cent., and in the 267 instances of facial erysipelas, 10 deaths, or 3.7 per cent. The average stay in hospital for 56 cases in 1888 was 21 days; for 190 cases in 1889 was 24.3 days; for 116 cases in 1890 was 20.4 days, or

THE TREATMENT OF ERYSIPELAS.

A PERSONAL EXPERIENCE IN FIFTY CASES.

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I HAVE prepared for consideration four series of tabulated cases : No. 1 being the cases admitted to Charity Hospital in 1888; No. 2, those in 1889; No. 3, those received up to June 1, 1890; and No. 4, the cases treated by myself outside the hospital. For the opportunity of observing cases in the wards, and for the privilege of publishing them, I am indebted to my colleagues of the surgical staff of the hospital.

The cases in the hospital tables for the two and a half years number 419, and my own cases since January 1, 1889, 47; making a total of 466 cases available for study.

While not bearing directly upon the question of treatment, I may be pardoned if I speak of some points made prominent in the tables before me. Thus of the 300 cases which were received at the hospital during 1888-89, the greater number by far occurred in the winter and spring months, as follows :

December . . .	18	June . . .	13
January . . .	28	July . . .	4
February . . .	49	August . . .	8
March . . .	37	September . . .	12
April . . .	64	October . . .	11
May . . .	47	November . . .	9
Total . . .	243	As against . . .	57

There is no doubt that more patients seek hospital treatment during the cold and damp seasons than during the pleasant months; still, there must be something beside this fact to account for the marked increase of the one over the other season, because the same thing is found in private practice, though in a less marked degree. My experience in town practice corresponds, in a great measure, with the showing of the hospital tables, and I find that the number of cases by months was as follows :

December . . .	2	June . . .	6
January . . .	7	July . . .	0
February . . .	9	August . . .	2
March . . .	5	September . . .	1
April . . .	3	October . . .	2
May . . .	8	November . . .	2
Total . . .	34	As against . . .	13

definite course, tending, when uncomplicated, to terminate favorably—excepting in the very young, when death almost invariably results—still I believe that by judicious treatment this course can be very materially lessened and in some cases brought to an abrupt termination; and for this reason I cannot agree with those who put faith in no treatment at all, and argue that because erysipelas is one of the diseases in which so great a number of diverse drugs and methods have been advocated, that none is good; nor yet can I accept the dictum of those who take a *laissez aller* view of the matter, thinking that the cases will do well enough if left to themselves.

Since Fehleisen's discovery of the streptococcus erysipelatus and the demonstrations of Hueter and others, which go to show that it is truly an infectious disease in all probability due to the presence and multiplication in the skin and subcutaneous tissues of a micrococcus, methods of treatment have in a measure changed, and the therapy of to-day is based largely upon antiseptic, anti-bacterial, mechanical and surgical procedures.

I presume that all have accepted Fehleisen's experiments with pure cultures in 1882 and the subsequent investigations of others as showing the contagious nature of the disease, and I believe that the future treatment of erysipelas must, in a measure at least, conform to bacteriological findings. Thus it has been found that the streptococcus grows more rapidly in parts well supplied with oxygen, and nothing seems to me more rational than to endeavor in treatment to shut off this supply so far as possible.

In twenty-two of my cases I have endeavored to accomplish this purpose by the application of an occlusive dressing having collodion as a base. In nineteen of them I have incorporated with the collodion ichthyol, and in three cases aristol. In four instances I have employed white-lead paint, as recommended by Lewis for the same purpose; in two I have used an ichthyol ointment; in two a resorcin ointment; in five a strong solution of permanganate of potassium; in seven a solution of the hyposulphite of sodium; in one case a bichloride solution; in one lead and opium; in one a saturated solution of boric acid; and in one the application of the tincture of the chloride of iron. In two instances I have performed scarification, and in two others have applied a tight adhesive strip above the affected area upon an extremity.

I will take up the more interesting cases one by one and speak of the treatment, and its effects as we proceed. First for the "genuine" facial cases.

CASE I.—Female, aged eighteen years. Erysipelas of face, involving first one side and spreading to the other, with formation of large bullæ.

Treatment.—Internal: Tr. ferri chlor. \mathfrak{m} xx every three hours. External: The same locally applied.

a general average of 22 days. Having digressed to this extent, I will now briefly outline the various methods of treatment which I have employed, first, however, giving the course of treatment which has been applied in the Charity Hospital cases.

1. In idiopathic facial erysipelas, as well as in non-traumatic cases elsewhere located, a paint having the following composition is applied over the affected region:

R.—Tinct. benzoin. comp.	. . . . .	3ij.
Collodion flex.	. . . . .	3j.
Glycerin.	. . . . .	5j.

Occasionally, acid. salicylic. ʒi has been added to the above. Internally, the tincture of the chloride of iron, 20 minims three times daily, is given in a routine manner to nearly all cases.

2. In consecutive cases, *i. e.*, of traumatic origin, where the inflammation is not deep-seated and there is not much tension, this protective and antiseptic paint is likewise employed, and a bichloride solution 1:5000 or 1:6000 is applied hot to the wound or raw surface. Iron is given as above in these cases.

3. In cases where there is much tension and the integument has been broken by bullæ or otherwise, hot bichloride 1:6000 is applied and several coats of the paint are used as a limiting strip above the affected part if upon the extremity, or surrounding it if practicable. The same dose of iron is likewise given in these cases.

The tables show that quinine enters largely into the treatment of the hospital cases, especially those in which a high temperature is present. Other drugs mentioned as being occasionally employed are calomel, digitalis, aconite, belladonna, antifebrin, antipyrine, and bromide for the delirium.

At times the above line of treatment has been deviated from by the trial of spirits of turpentine internally instead of iron, in dose of 10 drops three times daily. This appeared to do as well as the iron in some cases until about the third or fourth day of treatment, when it ceased to be tolerated by the stomach. Occasionally, too, iron has been omitted because it was thought to disagree in some way with the patient, but, as I have said, in the great majority of cases it was given as a matter of course.

Baths of a 2 per cent. solution of creolin have been tried, but without good results. Injections of iodoform in solution have been practised in some cases about the margin of patches with the idea of limiting the progress of the erysipelas, but no appreciable benefit has followed. Tincture of iodine used with the same object in view has resulted not more favorably.

Although my belief is that erysipelas is a disease of more or less

Treatment.—Ichthyol ointment, ʒij to ʒj. Antipyrine and whiskey internally.

Result.—Erysipelas at a standstill in two days. Recurrence after four days which lasted for five days, after which patient remained well.

CASE XXX.—Male, aged twenty-three years. Patient has rosacea. The day before my visit erysipelas had begun upon the left cheek. I painted the area over with a solution of permanganate of potassium, gr. xx. to ʒj. This had the effect of aborting the process within two or three days. Some three days later, however, the opposite cheek became affected, and under the same external treatment was well in four days without having spread to scalp or ear.

CASE XXXI.—Male, aged twenty-three years, son of Case No. VIII., which I attended in the same room one year ago. Three days before my visit there had been a decided chill, followed on the next day by a bright-red spot upon the bridge of the nose. There had been no injury or preceding lesion upon the face. When I saw the patient both cheeks, the lower eyelids, and the middle of the forehead half way to the margin of the hair were involved, and extension to the upper lids was just beginning. On the left side the redness extended quite to the ear, while on the right there was an inch and a half of apparently unaffected skin intervening. The usual general symptoms were present. This appeared to me a most suitable case for treatment by scarification. Securing the patient's consent, I placed a circle of criss-cross cuts about the patch upon the forehead midway between its margin and the hair line, extending them down over the side of the forehead and between the border of the erysipelas on the cheek and the right ear. As the disease had already reached as far as the left ear, no cuts were made on this side. I also laid a series of quadrilateral cuts just at the lower margin of the patch on a line with the angle of the mouth upon the right side, the cuts being made equally in the diseased and sound skin, according to the Riedel method, not over half to three-quarters of an inch in length, but quite close together.

Permanganate of potassium, gr. xxx to ʒj, was now applied over the whole surface, including the scarified portion. By the following day the disease had spread beyond the barrier, for about an inch upon the forehead, slightly beyond it on the right side as far as the ear, and not at all in a downward direction either upon the scarified or non-scarified side. Neither ear as yet involved. Bullæ over cheeks and forehead. Redness and swelling diminished in region of nose and lower lids. The following day both ears swelled and were included in the painting with permanganate. Two days later there was no pain or tenderness, the face appeared well, appetite good, tongue clearing, bowels regular. The next day the permanganate-blackened crusts were peeling off, and patient regarded himself as well and I so regarded him. No internal treatment had been used.

CASE XXXII.—Female, aged thirty-two years. (Wife of Case XXIV., who had twelve days before recovered from an erysipelas of the leg and thigh.) Chill on February 7th, erysipelas beginning in centre of left cheek February 8th and extending by February 11th to the whole face, causing closure of both eyes and almost occluding the nares.

Treatment.—Internally. Whiskey and antipyrine; locally, permanganate of potassium, gr. xxx to ʒj.

Result.—Recovery at end of ten days. The application of iron is not an agreeable dressing, and as it appeared to do no good I have not since tried it.

CASE II.—Female, aged forty-five years. Erysipelas involving whole face and subsequently the scalp.

Treatment.—White-lead paint to cover the whole face. When extension took place to the scalp the hair was cut short and the whole scalp painted. The general symptoms were very severe, and convalescence was not established until the twenty-third day. The paint was removed slowly and with difficulty from the scalp, and I would not advise its application to hairy parts.

In this case the use of the paint did not make a very favorable impression upon me, though the patient and friends appeared well enough satisfied with the result.

CASE III.—Male, aged thirty-four years. Erysipelas of one side of face. White-lead paint. Improvement till seventh day, when extension took place to opposite side of face and patient entered hospital. I saw patient about a week later, when recovery had taken place.

CASE IV.—Male, aged fifty-eight years. Treated with a very weak solution of hyposulphite of soda (ʒij to Oj) and internal symptomatic remedies (antipyrine, bromide). He was convalescent on the eighth day.

CASE VI.—Male, aged fifty years. Erysipelas of face. The same external treatment and iron internally (gtt. x every hour part of the time). The scalp became involved and the disease ran its course in fifteen days. Decided alopecia followed.

CASE VII.—Male, aged fifty-three years. Erysipelas began simultaneously in both ears and extended to the right side of the face. Same external applications. Although extension to cheeks, forehead, and scalp occurred, and large bullæ formed, after seven days the patient was practically well.

CASE VIII.—Female, aged forty-five years. Had previously suffered from erysipelas of face seventeen years before. Present attack began after exposure to cold and wet. After two days of hyposulphite solution locally, iron was given internally. On the seventh day desquamation had begun, there was no longer any fever, and convalescence was rapid.

CASE X.—Female, aged thirty-seven years. Whole face involved and great headache, not relieved by a drachm of antipyrine in divided doses. Great delirium at night. Here I used resorcin ointment in strength of ʒj to ʒij for the face, and a wash of ʒj to Oj for the scalp. Convalescence after eighth day, when wine and iron were given. The daughter of this patient had been a daily visitor at the house of Case VI., often being in patient's room during his illness, and probably in some unknown way brought the cocci home to her mother.

CASE XIX.—Male, aged eleven years. Erysipelas began at back of neck and extended over scalp. A younger brother of this patient was sick in the same room with migratory erysipelas of the body and extremities (Case XVIII. of table).

Treatment.—Ichthyol ointment ʒij to ʒj. In three days the boy was entirely well.

CASE XXIX.—Female, aged forty-four years. Erysipelas of a week's duration, starting from a lachrymal fistula. Involvement of both cheeks and ears and severe general symptoms.

CASE XLIII.—Female, aged seventeen years. Patient had just recovered from a tonsillitis. Erysipelas of left cheek, treated with ichthyol collodion and entirely well in three days, without extending.

Six other cases of facial erysipelas were subsequent to trauma or skin diseases, but presented all the features of the other cases. One started in an unhealed varicella pustule upon the ear of a girl of seven years and spread to the face and scalp. It was treated with ichthyol collodion and was well in five days. Another developed upon a scalp the seat of an impetigo, and was well under the same treatment in four days.

CASE XLI.—Female, aged twenty-three years. Six days after a scalp wound, in which several stitches were taken, erysipelas began upon the opposite side of the scalp at some distance from the wound and extended down over the forehead and cheek. I cleansed the wound, which was still discharging pus, and dressed it with aristol powder. To the erysipelas of the scalp I applied a 10 per cent. solution of ichthyol in water, and to the face ichthyol in collodion. In eight days patient was entirely well and wound had healed. At no time had there been any evidence of erysipelas very near the wound, although both sides of the face became affected.

CASE XLIV.—Female, aged sixty years, who had the most extensive gummous ulceration of the entire scalp which I have ever seen. There was an open ulcer the size of a half-dollar just within the hair line, and it was undoubtedly through this that inoculation took place. The whole face and both ears participated in the erysipelatous process, but the scalp remained free.

Treatment.—Solution of aristol in collodion, 5 per cent., and aristol powder freely applied to the open ulcers upon the scalp. The erysipelas was well upon the eighth day, when I made my last visit.

This case of neglected and untreated syphilis subsequently showed most rapid improvement under antisyphilitic remedies, with aristol applied locally to the ulcers.

CASE XVII.—Female, aged twenty-six years. Erysipelas of hand and arm. The special interest in the case is that the patient is the subject of marked elephantiasis of the legs, the right being much enlarged. Until this attack, it was not known that the upper extremity was affected with elephantiasis as I subsequently found it to be. There have been two previous attacks of erysipelas of the legs. I saw patient the day after erysipelas had begun in the hand, and painted the hand and arm with white-lead paint, and ordered some anodyne and antipyretic remedies. The heat and pain were so great in the night that the paint was removed and ice-cold cloths applied by the advice of another. These proved so soothing that the patient placed her hand upon the cake of ice which was kept at the bedside to cool the cloths, and went to sleep. At my next visit the fingers were icy cold, insensible, and presented a bluish, frozen appearance. I refused to give patient further advice excepting that she enter the hospital. This she did, and there had removed the distal phalanges of three fingers and the thumb.

CASE XXXVI. refers to this same patient. About a year after the unfortunate occurrence above narrated, I was called to attend her for an erysipelas of the left leg and foot, which had begun two days before in

On the 26th the erysipelas was well, after having extended over the entire scalp.

CASE XXXIV.—Female, aged twenty years. Patient has had two previous attacks; last one a year ago in same room. First seen March 26th, with history pointing to primary erysipelas of the larynx two weeks before. Aphonia still present.

The skin erysipelas began three days previously upon the bridge of the nose, and now involves the whole face and scalp. Eyes cannot be opened, delirium pronounced. Temperature $104^{\circ}+$. Had been treated. Ordered hair cut short, ice-bag to scalp, stimulants at frequent intervals, antipyrine to reduce the temperature. Locally, ichthyol collodion $\bar{z}j$ to $\bar{z}j$ (ichthyol $\bar{z}ij$, ether $\bar{z}j$, collodion $\bar{z}j$).

Next day, February 27th, great improvement. Menses occurred. No headache or delirium, less fever. Eyes can be slightly opened. Scalp covered with a 1 : 3000 bichloride wash. Iron internally. Four days later bullæ on face and scalp had dried into crusts and patient was up.

A month later patient came to me with a sty on the right upper lid, and six days later with a second one, and upon the cheek below was an erythematous spot strongly suggestive of a return of the erysipelas. I incised the sty, washed out with a bichloride solution, and prescribed a zinc oxide ointment for the erythematous blush, under which it entirely disappeared. Three days later, however, a bright-red, tender spot appeared just in front of the ear and upon the cheek on the left side. I now ordered to be applied twice daily a solution of permanganate, gr. xxx to $\bar{z}j$. By the following day the whole face was again covered by erysipelas and the eyes closed by swelling. There was some pain from the strong permanganate, so I substituted a 1 : 1000 solution of same to be applied hot. Three days later patient was up, the face free from swelling and beginning to desquamate. Patient remained well for three days, when a recurrence took place in one cheek. Ichthyol $\bar{z}j$ to water $\bar{z}j$ was applied, and iron was given in 15-drop doses every three hours. In two days symptoms were all absent, and no further recurrence took place.

CASE XXXV. occurred in a German woman, aged sixty-eight years, who had a hemiplegia of six years' standing, and was otherwise debilitated. Whole face and scalp were affected and there were severe general symptoms. Low muttering delirium day and night; dry, glazed tongue, sordes, etc.

Locally, permanganate gr. x to $\bar{z}j$, abundant supply of alcohol, and iron $\mathfrak{m}xx$ every three hours.

Thirteen days later patient was up attending to household duties. Fifteen days subsequent to this date a recurrence took place, but under the same treatment she was entirely well in four days.

CASE XXXIX.—A pregnant woman, aged thirty-seven years, had four weeks previously recovered from an erysipelas of the face treated with lead and opium wash, under the care of another physician. I saw patient the day after a recurrence had taken place, and ordered ichthyol collodion and iron $\mathfrak{m}xv$ every two hours. Case terminated favorably six days later.

CASE XL.—Female, aged twenty-five years. Erysipelas of whole upper portion of face, and eyes nearly closed. Treatment by ichthyol collodion $\bar{z}j$ to $\bar{z}j$. Cure in three days.

chest. On the right leg I made the incisions just in the border, extending equally into the patch and the healthy skin. On the opposite leg the same was done just above the ankle. The whole was then washed with a bichloride solution 1 : 1000, and this was also used as a dressing for the whole affected area. By the following day the margin of redness had extended slightly beyond the scarification upon both legs. On the right side of the chest it had gone about half an inch beyond both behind and in front, but on the left side the erysipelas had stopped exactly at the boundary line. General appearance of child improved. Brandy in frequent doses.

On the following day child began to cough and was very restless and weak, with faint moaning cry. Left leg and genital region much swollen and œdematous. No further extension beyond the scarified barriers excepting upon the right side of thorax, where the pink line has advanced about half an inch. The physician who had attended the child during the first days of its illness now again took charge of the case, which terminated fatally three days later.

CASE XXVII.—Brother of last case, aged one and a half years. Varicella had begun at same time fourteen days before, and erysipelas had shown itself coincidentally in both children eight days before I saw them. Here the dorsum of the foot was first affected in the neighborhood of a varicella lesion. Great prostration, complete anorexia, very weak pulse. Treatment up to this time had been iron internally and cold-water dressings. Ordered iron continued and brandy in frequent doses. Milk, etc. The affected areas and healthy skin beyond were thickly covered with ichthyol collodion.

Next day, no extension, slight improvement in general symptoms. Following day, extension to scrotum and pubic region, with great swelling. Ichthyol continued to the whole.

For three days both cases were in care of another physician. I now resumed charge and continued the ichthyol locally to leg, scrotum, and penis, which were enormously enlarged. One week later the boy was convalescent.

CASE XXXVIII.—Male, aged four months. Erysipelas of right leg and thigh, beginning in a varicella poek and rapidly extending. Patient had lived till recently with the grandmother, whom I had treated the preceding year for a severe erysipelas of the face (Case No. II.).

Treatment.—Ichthyol collodion, and internally iron, quinine, and brandy.

Following day, extension to groin. Fifth day, patient well.

CASE XX.—Male, aged three weeks. Erysipelas migrans gradually extending over the whole body, the head alone escaping. Disease began upon the genitals about a week after circumcision so badly done that the skin had been removed from the whole under surface of the penis down to the peno scrotal junction. In this case the erysipelas wandered for a second time over regions where recovery had apparently taken place. Finally, the day before death the bullæ became hemorrhagic, œdema of the skin in the region of the throat occurred, the breathing became much oppressed and the child sank rapidly.

Treatment had consisted in ichthyol collodion and ichthyol ointment to the wound upon the penis.

CASE XLVI.—Male infant aged three weeks. This child had been circumcised upon the eighth day, and when I saw him presented an

the region of the knee and had rapidly extended to the foot. The leg appeared enormously enlarged in consequence of the elephantiasis from which she suffered. I at once painted the whole area with ichthyol ʒij, ether ʒj, collodion ʒj, and gave internally:

R.—Quin. sulph.	.	.	.	.	.	.	.	ʒss.
Tinct. fer. chlor.	.	.	.	.	.	.	.	ʒij.
Aq. dest.	.	.	.	.	.	.	ad	ʒij.—M.

S.—One drachm every two hours.

In four days the patient was well and out of bed.

These attacks of erysipelas in elephantiasis have not been looked upon by some dermatologists as identical with the true erysipelas, but rather regarded as a species of lymphangitis. I must say, however, that I cannot take this view of the case in point. The appearances and symptoms entirely resembled those of other cases of erysipelas of the extremities, and I never saw a more typical instance of the disease than that presented by this patient's hand and arm the year before. There was in the case of the hand, as in that of the leg, marked striæ and cords of lymphangitic inflammation extending to the glands in the axilla and groin, attended with great tenderness and pain; but the same thing is often observed in ordinary erysipelas of the extremities without elephantiasis. This was true of Case XXIV. An erysipelas of the leg in a man aged forty-five years, not attributable to trauma, was attended with very decided lymphatic involvement causing painful red cords to extend from the patch to the groin, where the glands became very greatly enlarged. The usual ichthyol paint was applied over the whole extent of inflamed tissue in this case as well, and the iron and quinine mixture above mentioned was given internally. Patient was well in six days, though gland in groin remained tender for some days afterward.

As illustrating in a graphic manner the identity of this form of erysipelas and genuine facial erysipelas, the wife of this patient, who had carefully nursed him during his illness, was taken down with facial erysipelas twelve days after the latter's recovery, and hers is Case No. XXXII. of the present report and has already been referred to under the non-traumatic series of cases. One case developed from vaccination in a child of ten months, and four started in a varicella lesion.

One of these (Case XXVIII.), in a five-months' girl baby, proved fatal on the thirteenth day of the disease and five days after I first saw it. This was one of the cases in which I employed scarification. The erysipelas, which had begun in a varicella pustule upon the leg eight days before, had now extended up the back to the shoulders, over the thorax in front, to the ankle on the left side, and to below the knee on the right. The prognosis was most unfavorable, but I thought scarification offered a chance of checking the upward spreading. I made crossed incisions deep enough to draw blood about an inch above the margin of disease, according to Lauenstein's method, entirely surrounding the

temperature was 106° , and the patch had nearly reached the knee. I now applied several coatings of the paint one above the other just below the knee, and going above it I surrounded the lower third of the thigh with a tight band of adhesive plaster one inch wide. By the morning of the 9th the erysipelas had extended over the knee and the whole leg was now tensely swollen, painful and tender, with bullæ forming posteriorly. I found the plaster had just been removed because of complaint of tightness, but I at once reapplied it and forbade its being disturbed. During the day the disease extended to the lower border of the adhesive band, where it stopped abruptly. The temperature fell and convalescence began. The erysipelas was at an end in three days, but where the iodine had been applied in several coats below the knee there was a burning of the skin which took ten days to heal. The erysipelas had gone beyond the thick coating of iodine, but had been arrested so suddenly at the plaster that the family physician and friends were convinced equally with myself of the efficacy of this method, first proposed, I believe, by Wölfler, and recently recommended by Dr. Weber, of this city.

Other attempts at formation of a barrier have failed in my hands, excepting the partial success following scarification. I had previously tried iodine and strong solutions of silver, but do not remember a successful case. It has seemed to me that the power of the cocci to penetrate deeply into the tissues and their mode of travelling through the lymph channels rendered any method dealing with the surface alone as unlikely to check the spread. I can understand, however, how pretty firm compression of all the tissues of a limb, as by a tight band, might act in checking the onward march of the microorganisms. It is at least a rational procedure.

Scarification has had much said in its favor, and I have no doubt proves and will prove beneficial in some cases. To be successful, however, it must be repeated on successive days and one line of cuts after another be made as the spreading oversteps the attempted barrier. It is not an entirely new method, as many suppose. Leuroth proposed a method of treatment in the *Gazette Medical de Strasbourg* in 1870 which consisted in superficial linear scarification over the patch with others made so as to circumscribe it. Should the disease overstride this boundary, it was to be tried again.

Dobson is said to have proposed much the same process as early as 1828. Kraske, of Freiburg, operated first by scarification in 1886. After making crossed incisions he applied a five per cent. solution of carbolic.

Riedel in 1887 did the same thing in a number of cases, employing a 1 : 1000 sublimate instead of carbolic, and Lauenstein modified this in 1889 by cutting only in the sound skin. The latter is the process which strikes me most favorably.

Among other recently advocated modes of treatment (and new ones are being daily added, a fact which shows rather that anything may

extensive triangular wound left by the moël, who had removed the frænum and a large portion of the skin from the under surface of the penis just as in the preceding case.

Seven days later and two days before my visit a redness and swelling had appeared in the left groin. This was regarded by the physician who first saw the case as a beginning bubo. By the time of my examination, however, the erythema had extended to the scrotum, pubic region, and the inner and posterior surface of the thigh. Up to this time lead and opium wash had been employed without apparent benefit. Prognosis extremely unfavorable.

Having had what appeared to be a very favorable result from aristol in a case already related, I painted the whole surface over with a 5 per cent. solution in collodion of this new preparation, extending it beyond the margins of the disease. I also applied aristol powder to the wound. Internally, brandy.

Extension by next day to middle of back and over buttocks, downward to upper third of right thigh and to middle of left, entirely surrounding both limbs. I did not see child again, but was notified by the physician in charge that it died some three days later.

Another case in which aristol was used with good results is Case XLV., first seen on June 11th, one day after an erysipelas had shown itself near a lesion of ecthyma upon the leg of a boy aged nineteen months. At that time it extended from the middle of the thigh to the ankle. I applied a tight adhesive strip of plaster above the patch, as well as about the ankle below it, and painted the intervening space with a 5 per cent. aristol collodion. Brandy internally. The following day large bullæ had formed beneath the plaster bands and an erythematous blush extended for a slight distance beyond. The adhesive strips were removed and the whole surface was again painted with aristol collodion. Two days later erysipelas had extended above the rim of the pelvis. I now applied ichthyol ζj to ξj of collodion, as I could not obtain aristol. Extension next day to middle of back. Aristol collodion was now used again, and no further extension took place; the bullæ dried into crusts, and improvement rapidly followed.

The last case is in some ways the most satisfactory. It occurred on August 7th of the present year in the person of a three-year-old boy at a seaside hotel. Following a chill and high fever, erysipelas began simultaneously at both legs at about an inch distant from a pustule of unknown nature situated upon the anterior portion of either shin. When I examined the child I found a patch upon the left leg two inches in width almost surrounding the limb, and upon the opposite side a smaller patch. I at once bound up both legs in a solution of hyposulphite of soda in strength of ζj to ξj . Temperature was then $103\frac{1}{2}^{\circ}$ F. The same evening, in consultation with the family physician, Dr. Stub, of Brooklyn, a solution of iodine in collodion gr. x to ξj was applied to the patches and about an inch beyond them. Later in the night the rectal temperature was 107° and there were some convulsive movements and delirium. Antifebrin gr. v. was now given with whiskey and repeated every three hours. Several slight chills occurred and there was extension of the process about an inch beyond the painted margin on the left side.

The following morning temperature 105° , and gradual creeping of disease toward the knee. Application was made an inch beyond erysipelas margin as often as spreading was noticed. By evening the

adhesive strips. In erysipelas of the face which had not yet reached the forehead, or at least its upper part, I would apply a band tightly about the forehead and just above the ears, cutting the hair in a strip around if necessary to secure firm pressure. The chances of arresting the process here should be at least equal to those of checking the spread upon an extremity, for we have a hard bony base over which to make our compression. If the boundary is passed, then I should at once have the scalp shaved and apply another band higher up. The hair should be cut in any case in which the scalp is invaded or threatened. Then the same application of ichthyol in collodion can be made, as to the face or other part. If there be much tension, swelling, heat, and discomfort, (which is not apt to be the case under collodion), any oily substance can be applied over it.

In treating erysipelas the uncertainty of *prognosis* must always be kept in mind. Cases to all appearances mild in the beginning may become severe and prove fatal, while formidable appearing areas may suddenly cease spreading spontaneously. It is scarcely more safe to say a case will progress favorably (though the great majority do) than to claim that the particular line of treatment instituted has prevented an unfavorable termination, or proven abortive, unless a whole series of cases under a given method have terminated in a shorter than the average time.

Naturally, when the erysipelatous process has its sources in a pus collection such as an abscess, pustule, ulcer, foul wound, carious tooth, diseased duct, etc., the first care must be to secure as prompt and thorough disinfection and cleansing as possible. Pus must be destroyed and purity maintained. A solution of the peroxide of hydrogen will often be found useful in effecting this purpose. In such case a spontaneous halt may be hoped for. In the same way a diseased mucous membrane must be cared for; excoriations, ulcerations, rhinitis or other disease of the nasal mucous membrane or affection of the throat must be looked after. It is probable that every case of facial erysipelas starts from some local solution of continuity either upon the skin or adjacent mucous membranes, and we simply call some cases "idiopathic" or "genuine" when we fail to find the point where the micrococci have entered. I further believe it is because of this close proximity of various mucous membranes that erysipelas of the face is so comparatively frequent. That so-called idiopathic erysipelas of the face is identical with the traumatic variety I think is shown by the clinical history, course, and identity of the skin lesions in both processes, as is illustrated by Cases XXIV. and XXXII., where the husband's recovery from erysipelas of the leg was coincident with an outbreak of facial erysipelas in the wife. Since instances of direct contagion are not often seen, I would call attention to the frequency with which two cases occurred in the same family—no less than

appear to do good in uncomplicated cases running their natural course), is that of Behrend,¹ consisting of the application of absolute alcohol; that of Hueter, who advises injections of a 3 per cent. carbolic solution to encircle the patch. If a case is thus treated in an early stage, it is said to be possible to stop the whole process within twenty-four to forty-eight hours. J. Koch paints the diseased parts once daily with an ointment of

R.—Creolin	.	.	.	.	.	.	.	1 part.
Lanolin	.	.	.	.	.	.	.	10 parts.
Iodoform	.	.	.	.	.	.	.	4 parts.

and over this applies gutta-percha tissue. Kroell advises a band of gutta-percha in place of Wölffler's adhesive strip.

Calvelli uses a 1 per cent. solution of picric acid to paint over the erysipelas. Pirogoff, it will be remembered, treated a large series of cases by camphor, I believe in the army, with excellent results. (His paper is not now accessible to me.) Rosenthal² has employed with marked success a combination of the Pirogoff and Hueter methods, giving 2½ grains of camphor at a dose.

Levy proposes³ a spray of corrosive sublimate in ether 1:100, to be applied for a few minutes twice daily. Under this the fever in his cases lasted but three and a half days, while other methods showed eight days of fever.

With the most of these latter suggestions I have had no experience. In view of what I have learned from those cases which have fallen under my observation, I think the plan of treatment which offers the best results is about as follows:

First, internally, such symptomatic treatment as the nature of the case seems to require. Antipyretics only in case of high or persistent fever (over 103½° to 104°). Then antipyrine in dose of at least gr. xv-xx, for an adult, guarded by alcohol. Cooling drinks. Calomel or saline aperients in full dose if constipation. If much weakness, alcoholic drinks given freely, especially at critical periods, and iron or iron and quinine; digitalis if much fever and prostration; bromides for delirium; antipyrine or phenacetin for headache, with cold applications to head, and as concentrated and nutritious a diet as possible.

Second, locally, I would paint the patch and surrounding margin of healthy skin thickly with ichthyol in collodion, ʒj-ʒij to ʒj. If the scalp is the region affected, a watery solution or ointment of ichthyol can be employed. To arrest the spread I should in every case make an attempt either with the band of adhesive plaster or by scarification, or both, the latter to follow the former, in case the disease spreads beyond the

¹ Berlin klin. Wochenschrift, 1889.

² Ibid., No. 42, 1889.

³ Médecine Moderne, No. 20.

REVIEWS.

INFLUENZA, OR EPIDEMIC CATARRHAL FEVER. AN HISTORICAL SURVEY OF PAST EPIDEMICS IN GREAT BRITAIN FROM 1510 TO 1890. Being a new and revised edition of *Annals of Influenza*, by THEOPHILUS THOMPSON, M.D., F.R.C.P., F.R.S. By E. SYMES THOMPSON, M.D., F.R.C.P., Gresham Professor of Medicine and Consulting Physician to the Hospital for Consumptives and Diseases of the Chest, Brompton. Svo. pp. 490. London: Percival & Co., 1890.

THE interest of this book, as indicated by its title, is chiefly historical, but this is far from saying that it is not also of decided practical value. One fact which stands out prominently before the eye of the discriminating reader shows the fallacy of any system of medicine which prescribes for the disease rather than for the patient. The fact to which we refer is the variation of epidemic type, which is perhaps more marked in influenza than in any other affection. Regarding mankind as an individual, and supposing, as everyone does, the causes of disease to retain their identity, it must be admitted either that both suffer marked alterations with age, or that both undergo temporary modifications from transient external influences. The fact that much can be said in favor of each of these propositions might be regarded by the unreflecting as proof of greatly increased knowledge, but the ability to discuss does not necessarily imply wisdom. As regards influenza, the rays, so to speak, of which our knowledge is composed, instead of all uniting in a common focus, are, many of them, widely divergent. Indeed, little has been learned from the various epidemics beyond the fact that the disease is infectious, and this is nothing new. As our author pithily remarks: "The nomenclature of the disease, now definitely known as influenza, is not of the clearest. It is said that the word was originally introduced by the Italians, at a time when less was understood of its nature and origin than at present, if, indeed, this be possible."

It was an excellent idea to embody the writings of our professional forefathers in a modern treatise, if only that they might serve as studies of English style of a time when, as many hold, English was at its best. In this statement we refer particularly to the accounts of Willis, Short, and Sydenham, of which the quaint phraseology, instead of impairing their scientific value, rather serves to give them zest and flavor.

It is superfluous to say that this work will take a permanent place in the literature of influenza, for it is largely made up of writings recognized as classic. Dr. Thompson has brought it down to the present time by adding an account of the epidemic of 1889-90, which we can heartily recommend to all interested in this medical topic of the day.

F. P. H.

six times in the 47 cases. Twice husband and wife, twice in brothers, once mother and son, and once grandmother and grandchild. It will be noted in the histories given that internal treatment played a very unimportant part, and I am convinced that cases do quite as well without the large doses of iron so habitually given in this country.

As a prophylactic measure in those predisposed to repeated attacks, great care should be taken to discover and cure affections of mucous membranes, carious teeth, ulcerations, or other disease processes or conditions which I have mentioned as possible means of maintaining the tendency. Recurrences after apparent cure must be kept in mind and treatment continued sufficiently long to prevent them.

Since this paper was written I have applied the adhesive strip in three cases. Two were in erysipelas confined to the lower extremity. In the third it had already extended over the buttocks to the lumbar region before I saw the case. In the latter I applied a strip nearly two inches wide tightly about the abdomen, and painted the patch with 10 per cent. of aristol in collodion. No spreading occurred, and convalescence began at once. In one of the other cases the same treatment was successful, but failed in the second to arrest extension of the disease.

two points. Their color is at first white or whitish-gray with intensely red areolas, changing to pale yellow in a day, not unlike the appearance of the lenticular ulcer seen in connection with the exanthemata as well as with tuberculosis. Ulcerations in progress when the treatment is instituted become redder and are bathed in liquid pus for a day or two, after which they become cleaner and show a tendency to repair, though cicatrization is less rapid than is the case with erosions induced by the treatment. The rapidity of the process seems to account for the fact that perichondrial inflammation does not appear to progress to death of the cartilage. On the other hand, ulceration of the epiglottis at least has been seen to undergo arrest, and has been known to have undergone partial repair. Occasionally an area of disease has been aroused in the trachea.

The subjective symptoms, hoarseness, loss of voice, dysphagia, and suffocative dyspnoea may each and all be induced and subside with impressively distinctive rapidity. Extreme sensibility to laryngoscopic examination diminishes under the Koch treatment as does pain attending glutition. Mr. Lennox Browne would select those cases for treatment in which the pulmonary lesions were as chronic or limited as possible. He alludes to the risk of developing severe pulmonary complications, to arousing a latent pulmonary infiltration or the recrudescence of a lesion believed to have been healed. The existence of fibroid changes in the lungs would contra-indicate the treatment, or at least indicate great care in its employment.

The cases which form the basis of the observations recorded are described with more or less detail, and are largely illustrated by laryngoscopic pictures. It can hardly be conceded, however, that the results are encouraging enough to justify the conclusions of the author that they warrant perseverance in pursuing the treatment, even provided that due caution be exercised in the selection of patients and in every detail of administration.

There is much argumentative and instructive matter of general interest in connection with tuberculosis and its reaction under the tuberculin, the subject-matter of which must now be so familiar to our readers as to render further allusion to it superfluous.

J. S. C.

THE PROCLIVITY OF WOMEN TO CANCEROUS DISEASES AND TO CERTAIN BENIGN TUMORS, WITH AN APPENDIX ON HEREDITY AS A CAUSE OF CANCER. By HERBERT SNOW, M.D. Lond., etc. Pp. 58. London: J. & A. Churchill, 1891.

THIS little brochure is a lecture delivered at the London Cancer Hospital by one of the attending surgeons. The facts presented, while not especially new, are interesting and suggestive. Statistics form a prominent feature of the argument, and medical statistics, as Billings has conclusively shown, are only reliable when employed in a scientific manner.

The author's deductions are not all equally sound, since they may be divided into two classes: those resting upon a basis of fact, and those founded upon premises which are purely theoretical. We cannot deny

KOCH'S REMEDY IN RELATION SPECIALLY TO THROAT CONSUMPTION. By LENNOX BROWNE, F.R.C.S. Ed. Illustrated by 31 cases and by 50 original engravings and diagrams. 8vo. pp. 114. London and Philadelphia: Lea Bros. & Co., 1891.

THAT a considerable monograph, based upon personal observations of 31 patients—14 seen under Gerhard's care and 8 under Krause's in Berlin, and 9 under his own care—and copiously illustrated by laryngoscopic drawings and temperature charts, should have appeared as early as January, is an evidence of great assiduity on the part of the author, and, whatever be the outcome of the treatment, the effort will command appreciation for all time, for the accuracy with which the changes noted have been described and illustrated.

Beginning with a review of the author's previously published opinions on tuberculous laryngitis, in which he contended for the possibility of its existence as a primary lesion long before the fact had been demonstrated, Mr. Browne adds, as corollary to Virchow's statement, that the larynx is the most appropriate organ for the study of true tubercle, that it is also the most appropriate and convenient site for accurate observation of the various stages of its development toward reparation which takes place under Koch's treatment. He endeavors to show, step by step, that every stage in the life-history of the disease, which may extend over many months, or even years, can, under Koch's treatment, be developed and be compressed into a space of a few days, or, at most, of a few weeks. Not only this, but that reparation of ulcers and necroses may take place with amazing rapidity as recognizable in a series of laryngoscopic images observed from day to day.

While points of similarity occur in the natural evolution of the disease and in the evolution induced by the Koch treatment, there are a number of differences, the knowledge of which is important. Instead of the pallor peculiar to the natural form of the disease, reddening of the surface is produced under the injections, sometimes to an intense degree, and in some cases to such an extent as would lead to error in diagnosis by one ignorant of the treatment. Interarytenoid tumefaction, pyriform infiltration of the arytenoid regions, and the horseshoe and turban-shaped tumefactions of the epiglottis take place in the modified or induced laryngeal tuberculosis of the injection treatment, as they do in the natural evolution of the disease. In addition, infiltration often occurs lower down the larynx, not only in the ventricular bands, in the vocal bands, or directly beneath, leading to constriction of the lumen of the larynx as in the natural form, but with a levelling, as it were, of the horizontal planes of the larynx, so that the swollen ventricular band is almost on a line with the ary-epiglottic fold; while there is obscuration of the natural lines of definition and contour of the various component intra-laryngeal structures. These conditions lead to a stenosis which is one of the dangers to be apprehended as an immediate reactionary result of an injection, not always to be avoided even by very small or by slowly increased quantities of the remedy, or by its infrequent repetition. The gravity of this condition, however, is stated to have been grossly exaggerated. Ulcerations occurring under Koch treatment in the process of elimination of the necrotic tissues are rarely active at more than one or

The author has at command good English, and has, moreover, a happy way of saying definite things directly. There is a freedom from provincial or personal teaching which is very commendable. The treatment advocated, while it represents fairly that which is taught at the University of Pennsylvania, is in general decisive, but safe, and such as would, with a few exceptions, be accepted anywhere as sound. The plan of giving constantly definite suggestions for a typical treatment might be adopted with advantage by many systematic authors. It is not alone the beginner who sometimes searches in vain for a working method among the generalities of a text-book.

For such value as they may have, the appendix contains formulas with brief directions for the medical treatment of many surgical affections. Here, also, may be found explicit directions for the preparation of the usual antiseptic materials, including Lister's double-cyanide gauze. The book is one of the best of its class.

G. E. S.

RECENT WORKS ON DIAGNOSIS:

LEHRBUCH DER AUSCULTATION UND PERCUSSION, MIT BESONDERER BERÜCKSICHTIGUNG DER BESICHTIGUNG, BETASTUNG, UND MESSUNG DER BRUST UND DES UNTERLIEBES ZUR DIAGNOSTISCHEN ZWECKEN. Von DR. C. GERHARDT. Fünfte, vermehrte und verbesserte Auflage. Pp. 363. Tübingen, 1890.

(HANDBOOK OF AUSCULTATION AND PERCUSSION, WITH SPECIAL CONSIDERATION OF INSPECTION, PALPATION, AND MENSURATION OF THE CHEST AND ABDOMEN FOR DIAGNOSTIC PURPOSES. By DR. C. GERHARDT. Fifth, improved and corrected edition.)

AUSCULTATION AND PERCUSSION. By FREDERICK C. SHATTUCK, M.D., Professor of Clinical Medicine in Harvard University. Pp. 121. Detroit: George S. Davis, 1890.

THE PHYSICAL DIAGNOSIS OF THE DISEASES OF THE HEART AND LUNGS AND THORACIC ANEURISM. By D. W. CAMMANN, B.S. Oxon., M.D. Pp. 178. New York and London: G. P. Putnam's Sons, 1891.

A GUIDE TO THE PRACTICAL EXAMINATION OF URINE. FOR THE USE OF STUDENTS AND PHYSICIANS. By JAMES TYSON, M.D., Professor of Clinical Medicine in the University of Pennsylvania, etc. Seventh edition. Pp. 255. Philadelphia: P. Blakiston, Son & Co., 1891.

NOTES ON TYPHOID FEVER; TROPICAL LIFE AND ITS SEQUELÆ. By JEFFERY A. MARSTON, M.D., C.B., M.R.C.P., F.R.C.S., Surgeon-General Medical Staff (retired). Pp. 165. London: H. K. Lewis, 1890.

DIFFERENTIATION IN RHEUMATIC DISEASES (SO CALLED). Read before the Bristol Medico-Chirurgical Association. By HUGH LANE, L.R.C.P., etc. Pp. 27. London: J. & A. Churchill, 1890.

LITTLE need be said regarding a work so well and favorably known to the reader of German interested in methods of medical diagnosis as that of Gerhardt, beyond a brief mention of the appearance of a new

that the greater number of cases of cancer occur in women, and that the disease affects most frequently the breasts or uterus; but the statement that fibrous tumors of these organs are due to imperfect nutrition or perverted functional activity in civilized, as compared with savage, races is one not supported by such evidence as the scientific student demands. Is it a fact that carcinoma is "almost absent in the savage, while rapidly increasing in prevalence among the civilized?"

An ingenious attempt is made to show that the neurotic factor holds a position in the etiology of cancer hardly secondary to that of traumatism. "We never (?) see," the author remarks, "malignant disease of the pathological species in question (except as the result of injury) developed in the mamma of a woman leading a healthy, happy, well-balanced life."

The connection which he seeks to establish between chronic invalidism (which he attributes to the powerful causes, constipation, corsets, overstudy and tea-drinking) and malignant disease is somewhat obscure, though the argument is by no means unfamiliar.

More interesting to the reader than the lecture itself will be the short appendix on heredity, in which, after carefully weighing the statistical evidence pro and con, the author arrives at these conclusions:

"1. That belief in heredity is derived merely from popular tradition, and is wanting in any sound basis of scientific proof.

"2. That extremely practical issues are involved, and that the views now prevalent often lead to disastrous results."

H. C. C.

ESSENTIALS OF SURGERY, TOGETHER WITH A FULL DESCRIPTION OF THE HANDKERCHIEF AND ROLLER BANDAGE. Arranged in the form of Questions and Answers. Prepared especially for Students of Medicine. By EDWARD MARTIN, A.M., M.D., Instructor in Operative Surgery, University of Pennsylvania; Surgeon to the Howard Hospital; Assistant Surgeon to the University Hospital. Illustrated. Fourth Edition. Revised and enlarged by an Appendix. Philadelphia: W. B. Saunders, 1891.

THE development of special departments in modern medicine, and the consequent overcrowding of the student's time, have made necessary some measures of relief. While it is easy to say that a student should not be helped to a parrot-like method of acquiring knowledge by putting in his hands an epitome arranged in the form of question and answer, there are two sides to the question from the student's point of view. The wisdom of so planning a course in medicine that the work of five years is attempted in three may be questioned, but where such a plan is in force the student must accommodate himself.

Doubly unfortunate is it when, as is too often the case, fundamental subjects like general surgery are submitted to a scaling process. While such a book as that under consideration is, without doubt, abused by the indolent, it has still a limited field in helping the better student under pressure to crystallize information obtained in other ways. The question whether this epitome fills the place well is partially answered by the fact that four editions have been called for in a little more than two years.

tion of inspiration is three or four times longer than that of expiration. This, of course, applies to the *time* that the two signs are audible to the auscultator, but this is not made clear, and the ratio might be supposed to apply to the relative duration of inspiration and expiration, which of course is very different from this.

Dr. Cammann fails to grasp the difference between puerile respiration and harsh or vesiculo-bronchial, using these terms synonymously. Flint long ago pointed out the distinction, which, if not recognized, might readily lead to error. Puerile respiration has as its distinctive feature *increase in intensity without alteration in pitch*; whereas, harsh or vesiculo-bronchial breathing has alone *elevation in pitch*. Harsh respiration is a mingling of the bronchial and vesicular elements in varying proportions, while puerile respiration is simply an increased vesicular murmur.

The curious statement appears on page 157 that basic anæmic murmurs are usually heard in the aortic area and less commonly over the pulmonary.

We fear Dr. Cammann is somewhat over-sanguine as to the possibilities of auscultatory percussion. There is no doubt as to the great value of this much-neglected and little-understood method in the differentiation of organs and in outlining their boundaries, but that it ever can be of much practical use in detecting morbid changes in the viscera, especially the kidneys, through alteration in their percussion-note, is very problematical.

Little opportunity has been afforded Dr. Tyson to materially revise this edition of his very popular *Practical Examination of Urine*, because of few changes of importance in urine-testing occurring since the preceding issue of this book. The excellent albumimeter of Esbach is described; the newer tests for sugar are given, and a half-page is devoted to the description of phosphatic diabetes, an ailment which has recently attracted some attention abroad through the writings of Teissier and Ralfe.

Dr. Marston has prepared some very interesting notes, based on a large experience with enteric fever occurring among British troops in India. As is well known, enteric fever always has been very prevalent among these in that country, while it is exceptionally rare among the native population. Two powerful factors combine to enormously increase the susceptibility of the recruit to enteric fever—early manhood and recent arrival in a new, hot climate. So that no better opportunity could be afforded of studying the natural history of the disease than is presented in India.

Clinical features and anatomical characters of typhoid fever are the same in India as elsewhere, but whether the etiological factors are always similar Dr. Marston regards as somewhat doubtful. His remarks on causation are of great interest, based as they are on wide experience and accurate judgment. He finds himself unable to account for the origin of all cases of Indian enteric fever by the view of Budd (specific infection), or even by that of Murchison, and seems inclined to look with some favor on the doctrine that under certain conditions (chiefly climatic) this fever may originate unfathered by a specific bacillus or a pythogenic cause. He cannot well understand otherwise the development of certain cases in which all the evidence points against specific infection or spontaneous origin through filth. He, however, regards it

edition after the lapse of a number of years. This edition has been brought fully up to date in the various departments of physical diagnosis, of which it so ably deals. We know of no manual so complete without superfluous details. It is to be regretted that no English translation exists for the use of those who cannot readily read it in the original.

Dr. Shattuck's *Auscultation and Percussion* is one of the "Physician's Leisure Library," an excellent and popular series, issued in attractive form in neat paper cover for the modest sum of twenty-five cents. It covers a similar field to that of Gerhardt, though much less completely. It furnishes, however, an excellent *résumé*, in small compass, of the essentials of auscultation and percussion, and, so far as it goes, is quite beyond other criticism than that applicable to all more recent books on this subject—that the necessity for them does not exist. But since none has before been brought so within the reach of the most impecunious, its publication may not be amiss.

We cannot speak in very favorable terms of Dr. Cammann's manual, regarding it in the light of what he states he has endeavored to make it—a text-book on the Physical Diagnosis of Diseases of the Heart and Lungs. In addition to the criticism just applied to Dr. Shattuck's book, this one merits censure because of its inaccuracies and of the extreme views expressed on debatable points, the result of which cannot but be misleading to the student who looks to it for guidance. Not being satisfied with the generally accepted explanation of the origin and cause of crepitant and subcrepitant râles, and believing that identical rhonchi may be produced in the pleura, the author holds, as regards crepitant râles at least, that they are always of pleural production. There is no doubt that occasionally pleural friction may so closely resemble true crepitant and subcrepitant intra-pulmonary rhonchi that it is impossible to indubitably differentiate their site of production without attention to accompanying signs; but there are few who will accept, with this author, that these râles are always intra-pleural. According to this view, which Dr. Cammann devotes considerable space and ingenious argument to prove, the crepitant râle is indicative not of pneumonia but of pleurisy, and when encountered in the first stage of pneumonia indicates an accompanying pleuritis; so that in uncomplicated pneumonia the crepitant râle would not be present. Dr. Cammann neglects to explain why crepitation disappears with the onset of solidification and reappears with resolution. According to his view crepitus should be decided in the second stage of pneumonia; for he states that, to produce a shower of crepitant râles, an abundance of pleural exudation is necessary, and the accompanying pleuritis is more likely to furnish an abundance of exudate in the stage of consolidation than in that of engorgement.

It is very evident, however, that Dr. Cammann does not make a very nice distinction between crepitant and other forms of râles, for we find he states that crepitant râles are *usually* heard with inspiration, occasionally throughout it, and *sometimes* only at its close; indicating that they also occur with expiration. This may reasonably account for his ultra position. It is elsewhere, we believe, pretty well accepted that the true vesicular râles are heard only with the *end* of inspiration and never with expiration, while fine subcrepitant râles and friction-sounds resembling these and the crepitant râle occur with both *in-* and expiration.

Under the caption, Respiration in Health, it is stated that the dura-

South America and Africa. It is considered to be "simply and solely a relic of barbarism," long antedating historical record; and as probably associated with a primitive sacrificial idea, the devotion of a part for the whole body to some demon or deity. The practice has no real relation to hygiene as a motive.

The relative frequency of congenital phimosis and its causal relation to many important reflex conditions are admitted. From various eminent surgical writers opinions are quoted in favor of the wide extension of the operation of circumcision. It is admitted also that among uncleanly peoples cleanliness is favored by it, but shaving of the head might be universally advised with as much reason. The argument that it promotes chastity is considered of doubtful value. The evils of possible hemorrhage or sepsis, of unwritten suffering from exposure of highly sensitive surface, of premature excitement in children, of contracted meatus when the operation is early, are thought to weigh against the cutting method of treatment. Separation of adhesions and rapid dilatation of the prepuce under anæsthesia with some simple instrument, such as dressing forceps, will be found, in the author's opinion, to render cutting unnecessary in the large majority of cases.

In this neat little book no claim to originality of thought is made. The subject is simply reviewed, and the above conclusion drawn, with copious reference to a literature which is already sufficiently exhaustive.

G. E. S.

ESSAY ON MEDICAL PNEUMATOLOGY: A PHYSIOLOGICAL, CLINICAL AND THERAPEUTIC INVESTIGATION OF THE GASES. By J. N. DEMARQUAY, Surgeon to the Municipal Hospital, Paris, and of the Council of State, etc. Translated with Notes, Additions, and Omissions, by SAMUEL S. WALLIAN, A.M., M.D. 8vo., pp. xvi. 300. Philadelphia and London: F. A. Davis, 1890.

THE work before us is a translation of portions of the original of Demarquay, reported to the Academy of Medicine of Paris and published in 1866. The section on emphysema, and the chapters devoted to experiments with carbonic acid, in the original, are omitted in the translation; while at the conclusion of the work the translator has introduced notes, comments and additions. The subject of the gases in the blood is first taken up; then oxygen is discussed from an historical point of view, as to its physiological action, its mode of preparation and administration, and its therapeutic application; finally, some consideration is devoted to nitrogen, nitrogen monoxide and hydrogen. The subject of pneumatology has not, perhaps, received the attention, nor its principles the general application, which their importance deserves. Within the past few years, however, a fair amount of work in this department of therapeutics has been done, and the current literature contains numerous papers in evidence of the growing interest in the subject of the use of oxygen as a therapeutic agent. The translator's statement that Demarquay's work had been ignored in this country is erroneous. As long ago as 1867, it and the whole subject of pneumatotherapy received full attention at the hands of J. Solis-Cohen in his work on *Inhalation in the Treatment of Diseases*. Dr. Wallian by his labors has contributed materially to disseminate the principles of pneumatology, and to indicate the lines of their practical application.

A. A. E.

as more difficult, in a country like India, to exclude a pythogenic source than a bacillary one. He does not commit himself positively to either the autogenic or to Murchison's view, evidently feeling that the evidence in either direction is of a negative nature, which may be invalidated by more thorough methods of investigation. In this connection it may be of interest to recall the opinion of Rodet as to the relationship which he believes exists between the bacillus coli communis and the bacillus of Eberth; that under certain conditions the former bacillus, which when cultivated at a temperature of 44° to 46° C. becomes morphologically similar to Eberth's, may acquire pathogenic properties and induce enteric fever. An acceptance of Rodet's views would explain the pathogenic origin of typhoid fever and might throw light on the supposed autogenic cases of Dr. Marston. The altered condition of life of the newly arrived soldier in India, entailing increased physiological activity of the lymphatic and glandular system, especially of those of the intestines, might tend to furnish the suitable conditions for the transformation of the benign bacillus coli communis into the virulent bacillus of Eberth.

The chapters devoted to Tropical Life and its Sequelæ are not the least interesting in the book. They deal with the immediate and remote effect produced on Europeans who have resided in hot climates without having undergone thorough "acclimatization."

Differentiation in Rheumatic Diseases is a graphically illustrated reprint of a paper which appeared in the *Lancet*, October, 1890, by one who has had a large experience with this class of affections. It deals with the diagnosis and treatment of rheumatoid and rheumatic arthritis. The author believes that in most cases of the former a strumous taint exists which is very likely the underlying cause of the rheumatoid condition. It is, however, difficult to understand what he means by struma, since he uses the terms scrofula, struma, and tuberculosis as if they were quite unrelated. But the so-called theory advanced by Mr. Lane as to the association existing between struma, phthisis, and rheumatoid arthritis is not, as he seems to suppose, new. Dr. Garrod long ago stated his belief that the subjects of the tubercular diathesis—which nowadays we are to understand includes struma or scrofulosis—are especially susceptible to it.

D. D. S.

THE BARBARITY OF CIRCUMCISION AS A REMEDY FOR CONGENITAL ABNORMALITY. By HERBERT SNOW, M.D. Lond., etc., Surgeon to the Cancer Hospital. London: J. & A. Churchill, 1890.

THE author hopes to "contribute in some small measure toward the abolition of an antiquated practice, involving the infliction of very considerable suffering upon helpless infants."

Circumcision as a religious rite is traced from its first historical employment by Abraham to the present day. It is stated to have been long before that time widely observed among Ethiopians, Egyptians, Phœnicians, and other peoples; while at present the list of those who practise it includes many widely separated nations in Asia, Polynesia,

organisms which have previously been exposed for a time to such agents, Geppert shows it is very much less.

In the case of the organism we are considering, Dr. Abbott finds the amount of sublimate necessary to prevent the growth of perfectly normal staphylococci to be 1 part of sublimate in 75,000 parts of the ordinary peptone bouillon, or 200,000 parts of bouillon without peptones. So that, if organisms which have been once exposed to stronger solutions of this salt (1 to 1000) require less than these amounts to inhibit their growth, it is plain that special precautions must be taken to prevent transportation of this minute trace into the nutrient medium which is to demonstrate whether or not the organisms are capable of development.

The author gives in detail a series of experiments, and draws the following conclusions :

That, under the most favorable conditions, a given amount of sublimate has the property of rendering inert only a certain number of individual organisms—that is to say, the process is a definite chemical one taking place between the protoplasm of the individual bacteria and the sublimate in the solution.

The disinfecting activity of the sublimate against organisms is profoundly influenced by the proportion of albuminous material contained in the medium in which the bacteria are present. It was found that the relation between the golden pyogenic staphylococci and sublimate is not a constant one, organisms from different sources and of different ages behaving differently when exposed to the same amount of the disinfectant for the same length of time.

Many of the results of previous experimenters, who have assigned to corrosive sublimate more powerful disinfectant properties against the staphylococcus pyogenes aureus in cultures than the observations reported in this paper indicate, are attributable to the neglect of certain precautions now recognized as essential to the proper conduct of such experiments.

At the present stage of our knowledge in this direction it is plain that for use in surgical practice the solutions of corrosive sublimate do not possess all the advantages hitherto attributed to them.

In regard to the employment of sublimate solutions upon wound-surfaces, it is plain that there exist at least two serious objections: First, the albumin of the tissues and fluids of the body tends to diminish the strength of, or, indeed, renders entirely inert, the solution employed; and, second, the integrity of the tissues is materially injured by the application of this salt. The first objection cannot be met with certainty, for the surgeon possesses no means by which he can determine the amount of albuminous material with which his solutions are to come in contact, and in any case this large amount of albuminous material is an almost insuperable obstacle to complete disinfection with sublimate. He is, therefore, never in a position to say, *a priori*, that his efforts at disinfection of the wound are or are not successful.

During the past two years we have had sufficient evidence to lead us to believe that the normal tissues and fluids of the body possess the power of rendering inert many kinds of organisms which may have gained access to them. This function is therefore diminished, or, indeed, may be quite destroyed, by any agent which brings about alterations in the constitution of these tissues. We know that just such changes as those to which we refer are known to follow the application of sublimate solutions. It is plain, then,

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF
FRANCIS H. WILLIAMS, M.D.,
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CORROSIVE SUBLIMATE AS A DISINFECTANT.

Experiments published by DR. A. C. ABBOTT, made in the pathological laboratory of the Johns Hopkins Hospital, have a very practical bearing upon the value of corrosive sublimate as a germicide, and the results of these experiments lessen the high estimation in which this agent has been held by most investigators.

Dr. Abbott selected the *staphylococcus pyogenes aureus* for a series of experiments as to germicide power in consequence of the importance of this subject to the surgeon.

The tests hitherto made upon corrosive sublimate as a disinfectant have agreed in giving to it the first place in the list of these agents.

One method commonly employed in testing the value of any chemical substance as a disinfectant is to expose organisms dried upon bits of silk thread to its action for different lengths of time, and then, after removing and carefully washing the threads in water and alcohol, to place them in nutrient media at a favorable temperature and notice if any growth results from them. If no growth appears, the disinfection was presumably successful. Another common method is to mix fluid cultures of organisms with the disinfectant, and, after different intervals of time, a portion is taken from the mixture and placed in nutrient media just as in the other method.

Now, in both of these methods it is easy to see that unless special precautions are taken a minute portion of sublimate may be carried along with the thread or drop into the medium which is to determine whether or not the organisms on the thread or in the drop still possess the power of growth. For organisms in their normal condition—that is, those which have never been exposed to the action of a disinfectant—the amount necessary to restrain growth, for certain disinfecting agents, is very small indeed; and for those

offensive odor. He gave from 3 to 4 grains every two hours until the diarrhoea was checked, and then every three hours so long as there was fever.

DR. TEISSIER, of Lyons, prefers α -naphthol for producing intestinal antiseptics in typhoid fever. He gives it in 6-grain doses, combined with salicylate of bismuth, and he at the same time promotes free diuresis by cold-water enemata. He also gives enemata of quinine and cinchona as an "antithermic tonic." He observed that as soon as intestinal antiseptics was established the urine became green, the temperature fell, the albuminuria disappeared, the spleen diminished in size, and the tongue became remarkably moist. Convalescence was very rapid. He considers that naphthol acts by sterilizing the bacterial products in the intestine.

DR. SCHWARTZ has demonstrated that naphthalene administered internally diminishes the number of bacilli in fecal matter in the proportion of one-third to one-fourth. When its administration is discontinued, this proportion increases again. But naphthalene is not so safe or suitable an intestinal antiseptic as β -naphthol or α -naphthol.

DR. W. H. THOMPSON, of the Roosevelt Hospital, New York, is an advocate of intestinal antiseptics in typhoid fever. He looks carefully after the food administered; he never gives milk undiluted, but always mixed with an equal quantity of lime-water. He objects to beef-tea as setting up gastro-intestinal fermentation. He gives, also, 10 grains of saccharated pepsin with 10 minims of dilute hydrochloric acid every three hours. He also gives 10 grains of subcarbonate of bismuth every three hours; sometimes both medicines every two hours. He regards these as the best agents for the purposes of intestinal antiseptics.

Many physicians have recorded their approval of an initial laxative, and no doubt it is well, if there is no diarrhoea, to begin with one; we shall then have less hesitation in keeping the bowels quiet afterward. Indeed, it has been said that "purgation and antiseptics are, to some extent, interchangeable terms." An aperient expels the poisonous ptomaines and other decomposing substances from the intestinal canal, and, if given in the early stages, may actually prevent subsequent serious diarrhoea. But the use of aperients, to be perfectly safe, must be limited to the first ten or twelve days of the fever, the great risk attending their use in the later stages is the possibility of the existence of deep ulceration in the ileum, and, in that case, an aperient may mean the difference between life and death to the patient. At that period of the disease intestinal antiseptics can only be safely secured by the use of intestinal antiseptics.—*Lancet*, No. 3529, 1891.

DIAGNOSTIC VALUE.

Before the Niederrheinische Gesellschaft für Natur und Heilkunde, SCHULTZE (*Deutsche med. Wochenschr.*, March 26, 1891) stated that he did not consider the occurrence of reaction following injection of the Koch fluid, in cases in which tuberculosis was not suspected, as diagnostic of latent tuberculosis, as he had seen reaction take place in cases not tuberculous. In seventy-two cases of pulmonary and laryngeal tuberculosis treated with tuberculin, he found, by comparison, that the results did not materially differ from those obtained in previous years with other methods of treatment.

if we bring about in these tissues a condition of superficial necrosis—the condition following upon the application of sublimate—they are much less able to resist the inroads of infectious organisms than they would have been had they been left in their natural condition.

As a disinfectant, in the strict sense of the word, there are, perhaps, few substances which possess the property in a higher degree than does corrosive sublimate, but at the same time there is nothing which is employed for this purpose that requires greater care in its manipulation, in order to obtain its best results, than does this salt. In practice its action is influenced by a number of conditions which it is difficult, if not quite impossible, to control.

For these reasons we seem hardly justified in continuing to give to it the first place in the list of substances which may be employed practically for the purpose of rendering harmless materials containing the germs of infectious maladies.—*Johns Hopkins Bulletins*, No. 12.

OINTMENT FOR HEMORRHOIDS.

Hydrochlorate of cocaine	grs. xvj.
Sulphate of morphine	grs. v.
Sulphate of atropine	grs. iv.
Powdered tannin	grs. xvj.
Vaseline	℥j.
Essence of rose	q. s.

Make an ointment and apply to the affected parts after each movement from the bowels.

It is necessary to have the discharges of soft consistence.—*Journ. American Med. Assoc.*, 1891.

ANTISEPTIC TREATMENT OF TYPHOID FEVER.

In a lecture on this subject, at King's College Hospital, DR. YEO has called attention to the progress that the idea of an antiseptic treatment of typhoid fever is making amongst physicians in all parts of the world. He is unwilling, in the present stage of our knowledge, to put too much stress upon any particular manner of carrying out this idea, as we have probably not yet arrived at the very best means for doing so. What he says about the application of the idea of antiseptics in typhoid fever by various practitioners is of interest.

PROFESSOR PETRESCO, of Bucharest, has borne valuable testimony to the efficacy of naphthol. He had previously experimented with carbolic acid, salicylic acid, turpentine, benzoic acid, kairin, calomel, corrosive sublimate, and boric acid without any very favorable results. He then tried a saturated solution of sulphide of carbon, with which he was much better pleased; and lastly he tried naphthol, 15 grains three times a day, and had results more favorable than with any other remedy: the rate of mortality was reduced, and the course of the disease favorably modified.

DR. CLARKE, of Bristol, used hydronaphthol in five cases of typhoid fever, and all did well. It soon stopped the diarrhœa, and the stools lost their

of phenacetine. It has analgesic properties in doses of 7 to 15 grains.—*Deutsche med. Wochenschrift*, No. 15, 1891.

VEGETATIONS ON THE GENITALS.

R.—Acid. salicylic. grs. viij.
 Acid. acetic. ʒij.

Apply to the warts with a camel's-hair brush once or twice a day.—*Médecine Moderne*, 1891.

PIPERAZIN.

This substance has the property of dissolving a large proportion of uric acid. One part of the urate of this substance is soluble in about 50 parts of water. Urate of lithia requires 368 parts of water to dissolve it; the piperazin salt is, therefore, seven times more soluble than the lithia salt. Piperazin is not toxic and not caustic, and it appears to have advantages over other substances which may be used to act as solvents for uric acid. It seems to be worthy of trial in suitable cases.—*Berliner klinische Wochenschrift*, No. 14, 1891.

METHODS FOR THE ADMINISTRATION OF AMYL-HYDRATE.

A teaspoonful of amyl-hydrate may be taken at night in a small glass of beer. It should be stirred for seven minutes to insure solution. Or, of the following, one-half may be taken at night:

Hydrate of amyl	. . . . .	ʒi.
Water	}	āā ʒij.
Orange-flower water		
Syrup of bitter orange	. . . . .	ʒj.

It is necessary to remember that amyl-hydrate dissolves slowly in water and beer (one part to eight).

Amyl-hydrate may also be given in capsules, each one containing one-quarter of a drachm; three or four of these may be used for a dose.—*Nouveaux Remèdes*, No. 2, 1891.

DEATH DURING CHLOROFORM ADMINISTRATION.

The patient was a bright, perfectly healthy little girl, about eleven years of age. The operation was for the removal of a large mole, covering the greater portion of the surface of the cheek. There was nothing in the appearance of the child upon examination that would contra-indicate the use of an anæsthetic in any way, and chloroform was chosen.

The operation was done by Dr. C. T. PARKES, surgeon to the Presbyterian Hospital, Chicago, and the chloroform was administered by internes of that hospital.

The operation required about twenty-five minutes, and as it was about the face, the hands of the surgeon prevented the continuous administration of the anæsthetic; very little chloroform was given to the child. The instrument used for giving the anæsthetic was Esmarch's inhaler, a wire frame

AN ALKALOID FROM TUBERCLE BACILLI.

By treating the contents of tubes containing agar-agar cultures of the tubercle bacillus with hot water acidulated with hydrochloric acid, filtering, evaporating, precipitating with platinum chloride, separating the double salt with hydrogen sulphide, filtering, and evaporating to dryness, ZUELZER (*Berliner klin. Wochenschrift*, 1891) was able to obtain a chloride of an alkaloid, 0.01 of which, injected into rabbits and guinea-pigs, caused, in from three to five minutes, increased frequency of respiration, elevation of temperature and protrusion of the eyeballs. The eyes were brilliant, the pupils slightly dilated and the conjunctiva injected. The protrusion was the more marked on the side on which the injection was made. The symptoms lasted for from fifteen to twenty minutes. Three rabbits died after injections of 0.02 or 0.03. The muscles into which the injections were made were reddened and the seat of hemorrhages; there were also hemorrhages in the mucous membrane of the stomach and of the upper portion of the duodenum. In two cases there was ascites. Similar results followed introduction of the substance into the conjunctival sac.

THE CHEMISTRY AND TOXICOLOGY OF THE TUBERCLE BACILLUS.

WEYL (*Deutsche med. Wochenschrift*, 1891) examined, at the Hygienic Institute at Berlin, the product obtained by treating with dilute sodic hydrate, the scrapings from 600 glycerin-agar cultures of the tubercle bacillus. The yellowish turbid mixture coagulated, by gradual cooling, into two layers—an upper, resembling coagulated agar, and a lower, containing small, white shreds. The lower layer, after treatment with warm dilute sodic hydrate, consisted, microscopically, of folded membranes, and at irregular intervals of apparent, inflated tubes. It contained carbon, hydrogen, sulphur and nitrogen. Special interest attached to it because it displayed the specific staining qualities of the tubercle bacillus. This “white substance” probably represents the capsule of the bacillus, while the gelatinous substance of the upper layer represents the protoplasm of the organism. Analysis of this gelatinous substance places it among the mucins. Solutions of it were prepared and injected subcutaneously into rabbits, guinea-pigs and mice. In the guinea-pigs and mice, at the end of three or four days, local necrosis took place at the site of injection and a crust formed, which fell off in four or five days. From these experiments Weyl concludes that from cultures of tubercle bacilli a toxomucin can be obtained, which he does not believe to exist pre-formed in the bacilli.

HYDROCHLORATE OF PHENOCOLL—A NEW ANTIPYRETIC AND ANTI-RHEUMATIC.

This substance appears in the form of a white powder soluble in water. It is a compound of phenetidine and seems to be similar in action to antipyrine. Fifteen grains of phenocoll reduces the temperature about as much as would be accomplished by 22 to 30 grains of antipyrine or about 15 grains

more than three weeks after injection of tuberculin, and which, therefore, escaped criticism. The subject had enjoyed good health until a year previously. In August he had pleurisy, from which he recovered and was well for two months. In mid-December he had another attack, with cough, anorexia, debility, and sharp pain posteriorly on the right side of the chest. Examination, January 16th, revealed a large pleuritic effusion on the right. At the right apex the resonance was slightly impaired, the vesicular murmur enfeebled, and ill-defined râles were heard. The spleen was enlarged. Exploratory puncture brought clear serous fluid. There was slight fever, but no expectoration. The first injection, of 0.02, was made January 19th, and was followed by the usual reaction. January 20th, the effusion, which had re-accumulated, was again withdrawn; the fluid was serous. January 25th, the night-sweats increased; the dullness on the right rose above the angle of the scapula; headache and dry cough set in. February 5th, the seventh injection, of 0.02, was followed by shortness of breath, dryness of the throat, and pain in the right side. February 7th, rusty sputum appeared for the first time, in small quantity. February 8th, the expectoration was mixed with blood; there was pain in the throat. February 9th, the epiglottis was swollen and reddened, with small hemorrhages at its margin; the adjacent wall of the pharynx was swollen, reddened, and the seat of small hemorrhages; its surface was uneven from irregularities which were not typical tubercles; the right ary-epiglottic ligament was swollen, the interior of the larynx only reddened. February 10th, the temperature rose to 104° , and, with remissions, remained at about this level; the expectoration was at no time abundant. February 15th, it was bloody and purulent; for the first time bacilli were found; dyspnoea and cough increased. February 17th, grayish-yellow nodules were for the first time seen on the epiglottis. February 19th, a little more than four weeks after the first injection, coma, pulmonary oedema, cyanosis and death occurred.

The autopsy disclosed a general miliary or submiliary tuberculosis of unusually wide distribution. The lungs were large, inelastic, intensely reddened and slightly oedematous, with slate-colored induration at the apices; on the right there was a bronchiectatic cavity; otherwise the lungs were studded with small and large nodules, mostly miliary tubercles and some miliary areas of inflammation. The spleen was enlarged and pulpy and contained large numbers of delicate, translucent, light-gray submiliary tubercles. The liver, the cortex of the kidney, and the mucous membrane of the larynx and pharynx also contained many tubercles. The thyroid gland contained a small number. The eruption was profuse in the medulla of the upper third of the epiphysis of the femur. Beginning eruption and fibrinous exudate were present in circumscribed areas of the peritoneum and the recto-vesical cul-de-sac.

OESTREICH, for Virchow, showed specimens from a female patient, thirty-six years old, admitted to the hospital with involvement of the apices and signs of peritonitis, thought to be tuberculous. Twenty injections were given in the course of six weeks and a half. Each injection was followed by typical reaction, but fever existed also in the intervals. The condition of the patient became worse and death occurred. The apices of the lungs were destroyed by the phthisical process. The upper portion of the lower lobes

covered with flannel, with which it is impossible to absolutely prevent the entrance of air. The child made no demonstration of any kind that would attract attention. The operation was practically completed; the pigmented nævus was removed, and pieces of skin taken from the thigh for transplantation, to cover the defects and diminish the amount of scar, were being put in position; when, without any warning, without the administration of any chloroform for at least five minutes, the child was seized with general convulsions; she ceased to breathe, her heart ceased to beat, she gave a few gasps, and was dead.

Every effort was made for an hour and a half to restore circulation and respiration, by artificial respiration, injection of ether and whiskey and nitrite of amyl, and the use of electricity, but all efforts failed.—*Journal of the American Medical Association*, No. 7, 1891.

IODOFORM AND ARISTOL.

DR. RICHTMANN recommends that iodoform should in all cases be replaced by aristol; the latter has the advantages of iodine and of thymol without their drawbacks. It is not irritating, its absorption is not followed by toxic symptoms, and its odor is not disagreeable. Unfortunately, it is insoluble in water.

The following are some of the ways in which it may be used:

In the form of powder, externally, or one part dissolved in ten parts of ether for external use.

A mixture containing 3 per cent. of aristol, in 20 of olive oil and 77 of lanolin, is a good application for burns.—*Nouveaux Remèdes*, No. 4, 1891.

M E D I C I N E.

UNDER THE CHARGE OF

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TUBERCULIN: PRODUCTION OF DISSEMINATED MILIARY TUBERCULOSIS.

VIRCHOW (*Deutsche med. Wochenschr.*, 1891), before the Berlin Medical Society, opposed the view of B. Fränkel, that a period of three weeks must necessarily elapse between the invasion of the bacillus and the appearance of symptoms of miliary tuberculosis in man as in guinea-pigs. He then presented specimens from a case in which miliary tubereulosis appeared

nouncement: In the preparation of tuberculin an occasional tubercle bacillus may find its way into the fluid. No harm results, because the bacilli have been killed by the long-continued action of boiling. Koch states that dead tubercle bacilli introduced beneath the skin cause suppuration. This is true of infusions of cultures containing large numbers of bacilli. Single bacilli give rise to neither local nor general reaction. They cannot gain entrance to the blood-current from the subcutaneous connective tissue if not injected directly into a bloodvessel. Tuberculin is prepared from pure cultures of tubercle bacilli, and in its original condition can contain no other bacteria. Atmospheric germs may subsequently gain entrance, but these are usually not pathogenic and cannot multiply, on account of the large proportion of glycerin which the fluid contains. Tuberculin always has an alkaline reaction.

HISTOLOGICAL CHANGES.

NAUWERCK (*Deutsche med. Wochenschr.*, 1891) presented to the Verein für Wissenschaftliche Heilkunde, at Königsberg, a report of the results of examinations in twenty-one fatal cases and of fifteen specimens removed by operation from patients treated with tuberculin. The injections were followed by hyperæmia and exudative inflammation; not rarely with hemorrhage around the tubercle, which was often infiltrated with polynuclear round cells. In the base of tuberculous ulcers of the bowel, after prolonged treatment, a peculiar isolation of the tubercle was repeatedly observed, the cellular infiltration being limited to the surrounding structure. In a fatal case of gonitis, the appearances were such as to create the impression that acute necrosis and exfoliation had taken place; the surfaces of the exposed bone seemed to have been curetted. The loose structures in the joint presented the microscopic appearances of caseous necrosis. Tubercle bacilli were found in them as well as on the joint-surfaces. The walls of an abscess in connection with caries of the vertebra contained a large number of bacilli, as if, as a result of the injections, an enormous multiplication had taken place. In a fatal case of uro-genital tuberculosis, injections of tuberculin were followed by cough and an increase in the number of bacilli in the urine. The autopsy disclosed cheesy cystitis, ureteritis, old tuberculous pyelo-nephritis on the right, florid pyelo-nephritis on the left, with an eruption of fresh miliary tubercles in the mucous membrane of the pelvis of the kidney. The lungs contained small cavities, groups of gray or yellow nodules and miliary or submiliary tubercles. The spleen and liver contained miliary tubercles. In a fatal case of advanced phthisis, the autopsy revealed a general miliary tuberculosis, with tuberculous meningitis. In the case of a girl, three years old, with an ulcer of one cornea and purulent infiltration of the other, terminating fatally, a croupous exudation was found in the pharynx and larynx, together with a miliary tuberculosis. New nodules developed, in some cases, around older foci of disease. Tuberculous ulceration of the stomach was observed in two cases. Perforation of the pleura and pneumothorax were observed once. In numerous cases pulmonary cavities and intestinal ulcers presented evidences of a tendency to heal.

presented caseous bronchitis at several points. The peritoneum was studded with innumerable tubercles, from a size scarcely visible to that of a poppy-seed, gray, translucent, microscopically showing no sign of caseation, macroscopically showing retrograde changes. The development of a portion of the tubercles occurred during the time the injections were being given. Between the liver, stomach, spleen, and lung, an abscess had originated from an ulcer of the stomach. The mucous membrane of the intestine had undergone amyloid degeneration.

PRODUCTION OF ACUTE TUBERCULOUS MENINGITIS.

RÜTIMEYER (*Berliner klin. Wochenschrift*, 1891) reports a fatal case of acute tuberculous meningitis arising subsequently to treatment of a case of incipient phthisis with injections of the Koch fluid. Following an attack of influenza, the patient had cough, night-sweats, and a sense of oppression of the chest. There was some impairment of resonance on the right side of the chest, over the apex, anteriorly and posteriorly, with enfeebled vesicular murmur, harsh inspiration and bronchial expiration, and some fine râles. The sputum contained a small number of tubercle bacilli. Thirteen injections, in gradually increasing doses up to 0.03, were given in the course of sixteen days. There was the usual reaction; râles were, for the first time, heard at the left apex; the expectoration was increased; the sputum contained an increased number of bacilli. The patient lost eleven pounds in weight. The injections were withdrawn. Headache and vomiting set in. There were anorexia, weakness, and malaise. The sense of prostration became marked; there were pains in the limbs, mental unrest, and irritability, with a clear sensorium. Sopor, rigidity of the neck, immobility of the pupils, Cheyne-Stokes breathing, tracheal râles and death followed. In addition to miliary tubercles, lobular pneumonia and cavities in the lungs, the pia mater was cloudy and infiltrated, the posterior cranial fossa contained an ounce of reddish fluid, the ventricles were dilated, a small, cheesy nodule was found in the right occipital lobe, another at the base of the cerebellum, and submiliary tubercles at various parts of the brain.

BACILLI IN THE BLOOD.

LIEBMANN, of Trieste, reports (*Berliner klin. Wochenschr.*, 1891) nine cases, in which, after one or several injections of the Koch fluid, tubercle bacilli were found in the blood. In a note, the editor of the *Wochenschrift* disclaims all responsibility for the accuracy of the observations.

BACILLI IN THE FLUID.

MEYER (*Deutsche med. Wochenschr.*, 1891) found tubercle bacilli in each of five vials of the Koch fluid. To determine if these bacilli possessed activity, he injected portions from three into the anterior chamber of three rabbits, subcutaneously in two rabbits and one guinea-pig and into a vein of the ear of one rabbit. No reaction, either local or general, had occurred at the end of five or six weeks.

LIBBERTZ (*Deutsche med. Wochenschr.*, 1891) makes the following an-

of tuberculous ulceration of the rectum, was uninfluenced by the injections. In another, of tuberculosis of the epididymis, improvement at first appeared to take place, the enlargement diminishing, subsequently, however, becoming greater than it previously had been. The injections were discontinued because headache and vertigo raised the suspicion of tubercles in the brain or membranes. In cases in which resection had been performed some little time previously, early injections were followed by fever without local reaction. In the case of a boy, however, in whom a coxitis had been cured by resection two years previously, two injections were followed by fever and by redness and swelling at the site of operation. In a case of multiple osteomyelitis, with swelling of one hand, gangrene of the tips of the fingers of the same hand took place. In another case, in which resection of the knee-joint was performed, gangrene of the foot ensued.

ABSCESS; GLANDULAR ENLARGEMENTS; REMITTENT FEVER.

KIRCHHEIM (*Deutsche medicinische Wochenschrift*, 1891) presented to the Medical Society of Frankfort the results of his experience with the Koch fluid, and discussed certain questions related to the treatment. In one case, notwithstanding most careful asepsis, an abscess formed at the site of injection. The injections were made in cases in all stages of tuberculosis, except when death was imminent. With a single exception, febrile patients were not subjected to the treatment. In the case with hectic fever, after injections of from 0.003 to 0.005, with decided elevation of temperature, infiltrations of hitherto uninvaded pulmonary tissue, with consonating râles, could be detected, which phenomena disappeared in from twenty-four to forty-eight hours. In almost all other cases increase in weight was noted. This was especially marked in a man seventy years of age, who, during seven weeks, living under unchanged conditions, gained sixteen pounds in weight. In several cases of slight apical involvement, mostly in young persons, small doses early in the treatment, were followed by enlargement of the glands in various parts of the body, especially in the axillary and inguinal regions, occasionally in the submaxillary region. In one case, in spite of withdrawal of the injections, a mild, remittent fever continued for eight days, corresponding to so-called glandular fever. The swellings disappeared in the course of the treatment. In two cases, herpes of the cornea, without injection of the conjunctiva, developed and disappeared without local treatment. Kirchheim believes the reaction following injection a direct result of the action of the fluid, rather than an evidence of absorption of breaking-down tuberculous tissue. By a gradual increase in dosage, tolerance is established—the system accommodates itself to the action of the remedy. If a long interval be permitted to elapse between injections, treatment must be renewed with smaller doses. Even healthy individuals react to large doses. A tendency to cumulative action has not yet been demonstrated. The part which the reactionary fever plays in the curative effect is interesting. Fever is thought to be the means provided by nature for recovery from infectious diseases. Applying the principle to treatment by the Koch fluid, the intervals between injections would be made longer and the doses rapidly increased. Such a course, however, would be too dangerous to be maintained.

UNTOWARD EFFECTS IN TUBERCULOSIS OF BONES.

BRAUN (*Deutsche med. Wochenschrift*, 1891), before the Verein für Wissenschaftliche Heilkunde, at Königsberg, reported the results of treatment in surgical cases by means of the Koch fluid, covering a period of ten weeks. Adults, with external tuberculosis, in whom pulmonary involvement could not be detected, were given 0.01, children 0.005. Subsequently, the quantity was reduced to 0.005 and 0.003 respectively. Injections were repeated at intervals of two days. Other than transient redness or swelling, there were no local complications. Of 198 injections, in 92 the ascent of the fever-curve began in from five to seven hours; in 49 during the first four hours; in 43 between the seventh and tenth hour; and in only 7, later. The elevation of temperature in all cases was decided. Its duration varied from two to fifty-two hours. The pulse was usually accelerated. In the case of two children, the pulse was slowed and the temperature became subnormal. Headache was a pretty constant phenomenon. Chills occurred after eighty injections out of seven hundred. Cough and shortness of breath were present even when no pulmonary lesion existed. Vomiting, abdominal pain and diarrhoea were occasionally noted. Of 56 patients, 7 had herpes of the lips and cheek; in 10, other exanthemata appeared. In 4 cases an erysipelatoid eruption developed. Constitutional phenomena did not manifest themselves in all cases. Alarming collapse took place in one patient. The local manifestations were not constant. The swelling of an affected joint usually increased; occasionally it diminished. Existing sinuses sometimes closed rapidly. At times secretion was diminished, at others increased. To determine the diagnostic value of the remedy, injections of 0.01 were made in 33 patients in whom tuberculosis could not be detected, and thermometric observations made at intervals of two hours. Fever appeared in 10, but in slight degree. In exceptionally rare cases of tuberculosis injection was not followed by fever. This was demonstrated in a child with inflammation of the knee-joints, the tuberculous nature of which was proved by microscopical examination after an operation performed subsequently. It may be stated that, when local changes occur in a sinus or other evidence of bone or joint disease of doubtful character, following injection of 0.005 or of 0.01 of the Koch fluid, the disease may be considered to be tuberculous; while the absence of local changes, notwithstanding the possible occurrence of slight fever, excludes tuberculosis.

Of 7 cases of lupus treated, complete recovery took place in but one. In a second, recovery appeared to have taken place, but the cicatrix reopened. In two others there was decided improvement. One case obstinately resisted treatment. The results in 5 cases of tuberculosis of the vertebræ and of the pelvis were not good. In one, a latent osteo-myelitis was stimulated into activity. Four cases of hip-joint disease, without sinuses, improved. To prevent contractures the patients were kept in bed and extension employed. In cases of tuberculosis of the knee-joint, the swelling was usually aggravated, in one case to such a degree as to render incision necessary. The results were more favorable when sinuses existed. The sinuses closed speedily and the joints became relaxed and more mobile. In some instances the cure was facilitated by scraping. In one case, an anal fistule, the result

the adjacent tissue was transformed into masses almost cheesy. Microscopically, these masses were found to contain tubercle bacilli and to consist principally of amorphous matter. Nowhere could the beginning of a cheesy hepatization be found. The only appearances indicative of such a beginning were found in small areas at the periphery of the lobules, where the alveoli were filled with epithelial cells undergoing fatty metamorphosis. In a second case, which illustrated the transition from simple hepatization to gangrene, thirty injections were given in the course of twelve weeks. Death took place after a large cavity with pleural adhesions had formed. To this was added fresh hepatization in the lower lobe, in which unusually rapid and extensive breaking down of tissue, with the formation of cavities, was going on. In the intestine beyond the ileo-cæcal valve were an extraordinarily large number of ulcers, in the cæcum and ascending colon in part confluent, and all, Virchow expressed his satisfaction in saying, clearing up and in process of healing. A third case presented a combination of syphilis, phthisis and amyloid degeneration. But two injections, of 0.001 and 0.005 respectively, had been given. In addition to extensive florid phthisis, there was an exquisitely healed syphilis of the larynx, with extensive destruction of the margins of the epiglottis and the formation of deep cicatrices; the tonsils were also atrophied. In a child with tuberculous caries of the right hip, no signs of pulmonary disease were at first detected. Resection of the head of the femur was followed by an apparently good result. Subsequently, fifteen injections of the Koch fluid were made in the course of fourteen days. The autopsy disclosed an intense miliary tuberculosis, especially well marked in the medulla of the right femur, in the lungs and in the liver. In the region of the arytenoid cartilages, on either side, were deep perichondritic ulcers, the rest of the larynx being intact.

GRABOWER stated that his experience led him to believe that the development of gray miliary tubercles in places hitherto uninvaded was not a contra-indication for the continuance of the treatment. He presented two cases in which such nodules had appeared in the hitherto healthy larynx. In one, they disappeared in the course of treatment; in the other they were in process of disappearance. Transference of diseased tissue is to be expected in a curative process completed by absorption, but the process ought to exercise the greatest influence upon these new formations, as has been demonstrated in the larynx. The occurrence of new nodules becomes thus not a contra-indication, but an urgent indication for the continuance of the treatment.

JOLLY discussed the psychoses caused by the fever resulting from the injections, and reported three illustrative cases. In one, the injections had been made for two weeks, with considerable febrile reaction and delirium, following which a psychosis, lasting two weeks, developed. This is a so-called "fever-psychosis," of the variety which occurs after the decline of fevers, and known as collapse-delirium or delirium of deservescence, or epieritic or post-critic delirium. Such conditions are occasionally observed after all fevers *e. g.*, after prolonged fever occurring in the course of tuberculosis. The predisposing cause in the case in question was the mental depression in connection with the disease. The second case was in a feeble-minded individual, who stuttered and was hard of hearing. Relatively mild febrile reaction

In the case of lupus or accessible surgical tuberculosis, the injections may be continued in increasing doses as long as local reaction or improvement takes place. In case of pulmonary tuberculosis, treatment may be withdrawn when the subjective condition has become good, cough and expectoration have almost entirely ceased, bacilli are no longer present in the urine and a dose of 0.05 has been reached. In febrile pulmonary cases, in which, though a dose of 0.05 has been reached, no improvement in the objective condition has taken place and the sputum and presence of bacilli are variable, Kirchheim would rapidly run the dose up to 0.01, until further experience demonstrates the unwisdom of such a course.

ENCOURAGING RESULT IN LUPUS OF THE NOSE AND THROAT.

KRAUSE (*Deutsche medicinische Wochenschrift*, 1891), before the Verein für Innere Medicin, at Berlin, presented a case of lupus of the nose, gums, tongue and hard and soft palate, of four years' standing, in a woman, twenty-two years of age. Previous treatment had been only partially successful. On January 12th, treatment was begun with injections of the Koch fluid, the initial dose being 0.005. The reaction was intense, the affected parts becoming greatly swollen and new ulcers forming. The temperature rose to 104° after each of four subsequent injections. After the sixth, the temperature reached only 99.1°, and subsequently never more than 100.4°. At the end of the fifth week fourteen injections had been given and the dose reached was 0.06. The changes in the diseased areas were characteristic. Infiltrated nodules, however, remained, which may require surgical interference. Twelve pounds in weight were lost in three weeks, of which four pounds had since been regained. The loss of weight was due not only to the fever but also to the difficulty of swallowing in consequence of the great swelling of the parts. The result, while not complete or perfect, was encouraging.

BATCH OF GOOD AND BAD RESULTS.

Before the Berlin Medical Society, LASSAR (*Deutsche med. Wochenschr.*, 1891) presented a girl, thirteen years of age, who, for two years, had had a tuberculous ulcer, as large as the palm of the hand, on the extensor surface of the left thigh, which, in the course of about four weeks, after a number of injections of small quantities of the Koch fluid, cleared up and closed completely.

FLATAU presented a case of tuberculosis of the larynx, in which, after the eighteenth injection of 0.06, an eruption of acute miliary and submiliary tubercles developed in the larynx.

VIRCHOW presented the lungs of a man who had received twelve injections in the course of six weeks. At the end of this time there was continuous fever, and death occurred seventeen days subsequently. The lungs presented the picture of "black phthisis." There was extensive carnification, discolored by deposits of coal-dust, the interlobular septa presenting a grayish network. Two-thirds of one lung and somewhat less of the other were involved in the process. Within this tissue what would be called a dissecting pneumonia had developed. Large suppurating fissures had formed, while

tube was inserted. On the escape of the fluid the pupils, formerly dilated and inactive, contracted and regained their reflex activity at once. Twelve drachms of clear alkaline fluid were obtained, having a specific gravity of 1004, containing a large quantity of chlorides, but giving no reaction to tests for albumin and sugar. The child died five hours after the operation.

Case IV. Girl aged thirteen months. Ailing fourteen days. Semi-conscious on admission, with irregular breathing, sunken fontanelle, and well-marked *tache cérébrale*. Two days later convulsions occurred. Four ounces of cerebro-spinal fluid were withdrawn by a Sonthey's tube between two lumbar spines, the last two ounces being blood-stained. Death occurred the same day. The prick in the theca was not visible, but there was slight extravasation of blood on its outer surface. The canda equina was unhurt. There was extensive general tuberculosis.

Though none of the cases were successful, no harm in any one resulted from interference. To some there was temporary relief of the symptoms, and the necropsy in each case showed ample reason for the fatal termination.

SURGERY.

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SPONGES AND THEIR USES IN SURGERY.

After a careful consideration of the methods of preparing sponges in commerce, MAYLAND (*Annals of Surgery*, vol. xiii., No. 5), incited thereto by two cases of septic poisoning occurring in his practice, carefully considers the best methods of rendering sponges absolutely sterile.

He finds that sponges of close texture, even if soaked in a solution of carbolic acid up to the strength of 1 to 40, are not rendered sterile throughout. The central portions of such sponges, if planted upon nutrient gelatin, show abundant growths of putrefactive microbes. Again, the ordinary surgical sponge, impregnated with foul discharges and thoroughly cleansed with a solution of carbolic acid, likewise exhibits, when implanted upon nutrient gelatin, abundant growths. If, however, a solution of 1 to 2000 bichloride of mercury is employed, such sponges remain entirely sterile. He considers the small cut Turkey sponges the best, because, though their texture is close, their shape prevents them from being anywhere so thick as to prevent the thorough penetration of the antiseptic solutions.

induced the psychosis in his case, which took a melancholic-hypochondriac type. The third case illustrated the correspondence of the action of the artificial fever with that of natural fever. The patient had formerly had hysterical attacks. Following an abortion, a rapid phthisis developed. During and following the fever there was delirium, which ceased with the fever. Then, when the injection produced fever the delirium returned. Such conditions do not counter-indicate the treatment, but they admonish caution.

HENOCH expressed himself as disappointed with the results of the treatment. Of twenty children, including only two or three in an advanced stage, but without fever, many became worse; hectic fever developed in those who previously had no fever; the children wasted. Great care was exercised and the smallest doses were used. In a single case, in which the disease was checked and apparent improvement resulted, the condition subsequently became worse than it originally had been. The bad results are probably ascribable to anatomical conditions. In children, tuberculosis, as a rule, has a wider distribution than in adults; the glands, especially the bronchial glands, are rarely uninvolved.

PARACENTESIS OF THE THECA VERTEBRALIS IN TUBERCULAR MENINGITIS FOR THE RELIEF OF FLUID PRESSURE.

DR. W. ESSEX WYNTER (*Lancet*, No. 3531) has performed this operation on four occasions at the Middlesex Hospital, in cases where coma supervened with great rapidity, in the hope of relieving cerebral pressure by draining away cerebro-spinal fluid continuously by the theca vertebralis.

Case I. Boy aged five years. Coma on eighth day. A fine Southey's trocar and canula inserted close to the spine of the second lumbar vertebra, until the point touched the lamina, when it was diverted downward and inward through the ligamentum sub-flavum and theca. Clear fluid welled up at once on withdrawing the trocar, and more than four drachms of fluid escaped during the next twenty-four hours. The Cheyne-Stokes rhythm gave place to regular breathing, the color improved, and the child was enabled to swallow. The improvement was not maintained; the fluid ceased to run, and the case terminated fatally. Post-mortem there was considerable tubercle at the base, with opaque lymph, but no excess of fluid. The prick in the theca was not discoverable, and there was no evidence of damage to the cauda equina.

Case II. Girl aged eleven years. Coma on ninth day. The theca was punctured with a fine knife at the level of the second lumbar space. Clear fluid escaped with some force, and a small drainage-tube was inserted and an antiseptic dressing applied. Next day the temperature had fallen to normal and the child could be roused. The dressings were saturated with fluid and changed. On the third day the fluid ceased to escape and death occurred next day from coma. After death the aperture in the theca was found to have closed, and when the membrane was incised fluid spurted out in quantity. There was very little meningeal tubercle.

Case III. Boy aged two years and four months. Coma on fourteenth day. Theca opened at level of first lumbar vertebra, when several drachms of fluid escaped, the flow being increased with each inspiration. A drainage-

of ulceration within the appendix, or an already present small perforation. It is in such cases that Mackenzie says that we can expect, if an acute process is subsequently set up, that it will be a circumscribed rather than a general suppurative peritonitis. The frequent conjunction, in the collected cases, of adhesions with the severer forms of the catarrhal appendicitis with retained secretions or with minute perforations, seems to corroborate this view.

5. That as the diagnosis of the separate condition of simple catarrhal appendicitis and its complications of distention from retained fluids and of ulceration, are not at present to be differentially diagnosticated, and as it has been shown that each case can give rise to dangerous conditions, recurrences of severity and frequency should hereafter mean that an exploratory laparotomy should be resorted to, on the general principle of this being of less risk than the disease itself.

THE TREATMENT OF HYDATID DISEASE BY INCISION AND EVACUATION OF THE CYST WITHOUT DRAINAGE.

BOND (*British Medical Journal*, No. 1580), while conceding that all hydatid cysts in which suppuration has taken place should be treated by incision and drainage, believes that for cysts which are still living and growing, and which contain clear fluid with or without daughter cysts, incision and evacuation of the cyst contents without any subsequent drainage, or with only temporary drainage for a few hours after the operation, is a procedure which deserves prominence in the minds of surgeons. He reports a case in point. There was a large cyst situated between the bladder and rectum beneath the peritoneum; this had grown upward, filling the pelvis and blocking the bladder and the urethra. The bladder was dragged up till its fundus reached to within two inches of the umbilicus.

The cyst was at first aspirated. Three weeks later it was treated by incision. The elastic cyst proper had separated from the outer cyst wall and lay loose in the cavity, together with much pus and several smaller daughter cysts. The elastic membrane and contents were removed entirely. The cavity was sponged out and a large drainage-tube was inserted. On exploring the general peritoneal cavity, a small cyst about the size of an orange was found in the reflection of the peritoneum in the right iliac fossa. This was incised, and the elastic membrane and clear fluid were removed. The remains of the cyst were then returned into the peritoneal cavity. At a subsequent operation no trace of this cyst could be found. A third large cyst was noticed in the epigastric region, but was left for subsequent treatment.

Five months later, on examination, the cyst in the epigastrium was the size of a foetal head, and there was another cyst in the lower part and to the left of the abdominal cavity. The abdomen was opened by median incision, passing through the umbilicus, and three cysts were discovered; these were incised. As a result of this the white elastic cyst proper shrank somewhat away from the walls or ectocyst, and lay, together with daughter cysts, in the cavity. It was easily withdrawn with ring forceps, although, from its brittleness, in several pieces. One omental cyst was removed entire, after tapping,

The question of the proper manner to store sponges is one of extreme importance. A number of sponges were kept for nine months, some in a solution of 1 to 20 carbolic, others in a solution of 1 to 500 bichloride. Both sets were darkened, but neither suffered in consistence, and even by microscopical examination no changes in texture could be detected. The sponges will in time darken, not from being actually dirty, but from the process of pigmentation. It would seem, then, that after the sponges have been thoroughly cleansed, storing in 1 to 500 bichloride solution renders them absolutely sterile and does not impair their useful qualities.

The author has usually employed the hyposulphite process in preparing sponges; that is, the sponges are first steeped in a hydrochloric acid solution, 1 to 10, then immersed in a bath composed of hyposulphite of soda one part, hydrochloric acid two parts, water twelve parts. This solution is then pressed out, and the sponges are well washed in cold water. They are finally placed in a bath containing half an ounce of carbonate of potash.

Objection is raised to using the sponges more than once, since while it is quite possible to render a septic sponge aseptic, there is no means of knowing whether or not ptomaines or toxic albumoses may be present, and there is no known agent which can be relied on to counteract the possible toxic effect of such substances.

RESECTION OF THE APPENDIX VERMIFORMIS DURING THE QUIESCENT STAGE OF CHRONIC RELAPSING APPENDICITIS.

WEIR (*Annals of Surgery*, vol. xiii., No. 5), after a careful study of the reported cases of operation upon the appendix vermiformis during the intervals of attack, sums up his ideas upon the subject as follows:

1. That the final outcome of the review of these cases has been that the large majority of recurrent attacks are due to catarrhal appendicitis, which, though to an unknown degree capable of producing explosive and serious peritoneal inflammation, yet generally, from the lumen of the tube being previously shut off from the cæcum, limits correspondingly the chances of fecal or severe infection of the peritoneum.

2. That the simple catarrhal appendicitis can be suspected when the recurrences are frequent—that is to say, more than four or five times, as in the acute processes this is seldom exceeded—and when such attacks are not of a severe type, nor of greater duration than a week, and particularly so if there be no appearance of a distinct tumor.

3. In such cases delay in operating may be encouraged to a reasonable extent, at least until it is indubitably proven that the invalidism is a confirmed one. Out of five cases seen by Weir in the last year for recurrent attacks of appendicitis, in three, of the above-described simple form, it was advised to wait till the next acute attack presented itself as a further justification of surgical interference; but this did not occur in any of these. In the two others, from the persistent invalidism or the severity of some of the attacks, an operation was advised.

4. Where a tumor is present in the quiescent stage, or has been decidedly felt after the acuteness of the attack has passed off, more urgency is present, as it indicates, it is believed, either an accumulation of noxious contents or

cases of varicose dilatation of the veins of the leg, where this dilatation affects not only the branches of the vein but the main trunk also, ligature of the saphena magna. Before operating the surgeon must assure himself that the dilated trunk is the only one which carries the blood from the parts below, since very frequently there are two principal branches of the saphena, which, if both are so widely dilated that the valves are incompetent, must both be tied before any amelioration can be expected. The best place to perform this ligation is about the middle of the thigh. An incision an inch long is made in this region; the vein is exposed, a double ligature is applied, and the vessel is divided between. As a result, the blood is carried from the superficial portions of the limb by the deep communicating veins. The improvement is immediate and permanent. Long lasting varicose ulcers heal quickly after this operation. Frequently the varices do not entirely disappear, but the condition is always greatly improved. Of course, this method of operating requires the most careful application of antiseptics.

EXTIRPATION OF THE LARYNX.

TAUBER (*Archiv f. klin. Chir.*, Bd. xli., Heft 3) has tabulated 163 cases of extirpation of the larynx, and has analyzed his tables with typical German minuteness. As a general result he finds that the operation is followed by death in 69.9 per cent. of all cases. Permanent cure—that is, failure of the disease to return for three years after operation—is noted in 7.9 per cent. of the cured cases. It is a well-known fact that in Spencer Wells's hands ovariectomy gave a mortality of 70 per cent., and that by improvement in technique this mortality has fallen to less than 4 per cent. There is little hope held out by Tauber that a similar improvement in the results of laryngectomy may be expected, since the percentage of death is the same now as it was ten years ago.

It would seem from this study that laryngectomy is an operation which should not be performed, since even when from mechanical interference a tumor of the larynx threatens to produce a fatal result, tracheotomy will afford immediate relief, and there is about as much assurance against recidivity as is afforded by complete extirpation of the larynx, at least in such cases as are far advanced.

BARDENHEUER (*Ibid.*) takes quite an opposite view of this operation. He believes that he has so improved the technique that the mortality will be greatly lowered, and instances, in proof of this fact, that while his first four patients died immediately following the operation, the last four, treated by a different method, all recovered. He found that the patients died not immediately after the removal of the tumor, but in from eight to four days, and that the mortality was due to septic inflammation, usually beginning in the deepest portion of the wound, in the space between the trachea and the surrounding muscular tissues. From this position inflammation extended along the loose cellular tissue of the neck into the mediastinum, and death usually resulted from septicæmia and pneumonia. The cause of infection was usually penetration of the liquid food and of the secretions of the mouth into the deeper portions of the wound. Bardenheuer modified his laryngectomies by attempting to sterilize the mouth for several days before operation.

by ligaturing that portion of the omentum to which it grew. The two cysts treated by removal of the walls were drained for sixteen hours.

As a result of experience in these cases, Bond concludes that when there is difficulty in bringing the cyst wall to the surface of the body, provided due care be taken to evacuate the cavity of all the fluid and elastic contents, the inverted edges of the incision into the cyst may be sutured, and the whole may be returned into the abdominal cavity. Hemorrhage will probably not occur unless it is occasioned by interference with the outer wall or ectocyst. Sutures should be applied to the inverted opening to prevent the entrance of a coil of intestine. Cysts of the liver and other organs are apparently amenable to the same treatment. The elastic lining shrinks on withdrawing the fluid, and can be drawn out by means of gentle traction with forceps. Even in suppurating cysts in which drainage is necessary, it is important to remove the solid contents at the time of incision.

THE OPERATIVE TREATMENT OF RECTAL CANCER.

In a brief but very excellent *résumé* of this subject, THORNDIKE (*Boston Medical and Surgical Journal*, vol. cxxiv., No 19) reviews the methods of operation for malignant disease of the rectum. From the study of a large number of statistics he finds that excision of the rectum from below gives a mortality of about 15 per cent., and that about 10 per cent. of the cases which survive the operation are permanently cured. Only those cases in which the examining finger in the rectum easily reaches the upper limit of the disease are subject to operation from below.

Kraske, by approaching the seat of disease from behind, instead of from below, has greatly extended the possibilities of complete extirpation of cancerous disease, even when the bowel is involved high up. By enucleation of the coccyx and the removal of a small portion of the lower part of the sacrum, he secures a large opening which affords ample opportunity to view the rectum and to work upon it. If the anal portion of the bowel is involved, and the disease is not very extensive, a resection is readily performed. The two ends of the bowel may then be brought together in front, the posterior opening being left to be closed by secondary operation. Or the following plan, devised by Hoehenegg, may be adopted: The upper segment of the bowel may be telescoped through the lower, and may be held in this position by a double row of sutures, one row above the anus and the second row about the margin of the anus. If the anal portion of the gut has been removed, an artificial anus must be formed. In this case the bowel involved is brought out through the sacral opening, the wound being allowed to heal with a drainage-tube packed into it. The sacral anus is provided with a pad made by Leiter, which does its work so thoroughly that patients are exceedingly comfortable while wearing it.

LIGATION OF THE SAPHENA MAGNA FOR VARICOSE VEINS OF THE LOWER EXTREMITY.

TRENDELENBURG (*Beitr. zur klin. Chir.*, Bd. vii., Heft 1, and *Rundschau*, 32 Jahr., Heft 5) recommends as an exceedingly efficient treatment in certain

the relative weight of the child and the placenta: the results have been incorporated in a series of elaborate tables, from which he draws the following conclusions:

The placenta being completed at the sixteenth week, a study of its relative size may begin appropriately at the seventeenth week. In the cases observed, the average weight of the placenta to that of the child was one-third from the seventeenth to the thirty-second week. Between the thirty-second and thirty-third week the placenta attained its acme of weight, and remained stationary at this point unless influenced by derangements of the foetal circulation, until birth at the fortieth week. Thus, during the thirty-third and thirty-fourth week the ratio remains one-third; during the thirty-fifth, thirty-sixth, and thirty-seventh weeks, it is one-fourth; in the thirty-eighth and thirty-ninth, one-fifth; and at the end of the thirty-ninth, two-ninths. From the end of the thirty-ninth week until birth, whether labor occurs at the fortieth week or is delayed until the forty-fourth, the ratio remains one-fifth. After the fortieth week, the placenta seems to grow rapidly in multiparae, or with women having large children, thereby raising the average from one-fifth to one-fourth.

A CASE OF RETRO-PERITONEAL PREGNANCY.

JAGGARD (*American Journal of Obstetrics*, April, 1891) describes a case of retro-peritoneal pregnancy in the seventh month as follows: The pregnancy was the first, the patient suffering during the entire time from pain and weakness. The size and shape of the abdomen were suggestive of twin pregnancy; the uterus did not exhibit the usual signs of pregnancy, and the woman's condition was so serious as to render operation impossible. Transfusion of twenty ounces of salt solution was performed, and it was determined to wait, hoping for an increase in the strength of the patient; she became able to leave her bed and seemed to be gaining; on the ninth day symptoms of septic infection manifested themselves and the tumor became emphysematous. It was determined to dilate the cervix and version was performed, with the extraction of a macerated foetus. The placenta was half adherent and half detached; death followed soon after the operation. A post-mortem examination was immediately made; it was then discovered that the pregnancy originally developed in the right broad ligament, the ovum passed up into the abdomen behind the peritoneum. Death of the foetus, with placental hemorrhage, was caused by exertion. The dilator employed to dilate the cervix had ruptured the posterior wall of the lower uterine segment and opened into the foetal sac.

INTRA- AND EXTRA-UTERINE PREGNANCY OCCURRING COINCIDENTLY IN THE SAME PATIENT.

The unusual coincidence of normal and ectopic pregnancy is illustrated in a case reported by WORRALL, in the *Medical Press*, page 296, 1891. The patient was a multipara who was awakened at night by severe abdominal pain, followed by slight hemorrhage; she recovered her health, the abdomen enlarged, and she was told that she was pregnant; the tumor gradually decreased in size and menstruation returned; when examined, the abdominal tumor was

The teeth were subjected to repeated frictions with antiseptic solutions, and the mucous membrane was dried with salicylic cotton. His next modification consisted in so placing the patient after operation that secretions of the mouth could not drain into the wound. The mattress was so arranged that the head was extended backward, and the pharynx was on a lower level than the cavity made by extirpating the diseased trachea; hence fluids gravitated to the mouth, and not away from it. His final modification consisted in carefully respecting the anterior wall of the œsophagus and the mucous membrane of the trachea immediately below the epiglottis, so far as it was healthy. After removal of all the diseased portions, the anterior wall of the œsophagus was brought forward and stitched to the mucous membrane of the trachea, thus forming a septum between the mouth and the wound cavity. Further, the free edge of the epiglottis was freshened and stitched back to the anterior wall of the œsophagus. The cavity of the wound was then firmly packed with sterilized gauze, and the dressing was changed in from two to eight days, depending upon the length of time the stitches held. Frequently the patient was able to swallow, thus relieving the operator of the necessity of passing an œsophageal tube. The sutures shutting the mouth from the wound cavity need not be left longer than fourteen days, since this is a sufficient time to allow of protective granulations being formed.

PALLIATIVE OPERATIONS IN CASES OF ENLARGED PROSTATE.

VIGNARD (*Annal des Malad. des Org. Génito-urin.*, vol. x., 1891; *Centralbl. f. Chir.*, No. 10, 1891) believes that in the very great majority of cases of hypertrophy of the prostate, bloodless therapeutic measures are sufficient. He would recommend surgical intervention—that is, puncture of the bladder or supra-pubic cystotomy, or the boutonnière operation—only in cases of retention where catheterization is impossible, and where septic urine absolutely requires evacuation; in cases where great difficulty in passing the catheter is not relieved by permanent catheterization; and in cases of cystitis not relieved by careful and long-continued medication. In the first two instances the boutonnière operation is indicated, whilst where cystitis is present supra-pubic cystotomy should be practised.

OBSTETRICS.

UNDER THE CHARGE OF

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THE RELATION OF THE WEIGHT OF THE PLACENTA TO THE WEIGHT OF THE CHILD.

J. H. SMITH, Assistant in the Frauen-klinik, Munich, took the opportunity of searching the records of five hundred births to obtain statistics regarding

centrated solutions of ptomaines, which are highly poisonons. Most rational and safe is the treatment of this condition by irrigating the uterus with sterilized water at 104° F. The heat stimulates the uterus to contract and expel poisonous materials, while the water dilutes the ptomaine solutions until they are innocuous.

GYNECOLOGY.

UNDER THE CHARGE OF
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OF NEW YORK.

THE ACTION OF ANTISEPTICS UPON THE PERITONEUM.

DELBET, GRANDMAISON, and BRESSET (*Annales de Gynécologie et d'Obstétrique*, 1891) as a result of their united experiments and observations, arrive at the following conclusions:

1. The strong antiseptics, such as carbolic and salicylic acids, corrosive sublimate and biniodide of mercury, present more disadvantages than advantages, since they irritate a healthy peritoneum and thus favor the formation of adhesions.
2. The most useful solutions to be employed in laparotomy are one of sodium chloride (six or seven parts to one thousand), and of boric acid (three parts to one hundred).
3. Iodoform and salol exert but little action upon the peritoneum, and it is a question if they have any antiseptic effect.

URETERO-VAGINAL FISTULA.

ALTHEN (Inaugural-dissertation, Munich, 1889; abstract in *Centralblatt für Gynäkologie*, 1890) analyzes thirty-five cases, the histories of three of which were recorded at Winckel's clinic, and finds that in the majority the condition could be traced to a previous severe instrumental delivery or operation, especially vaginal hysterectomy and the opening of pelvic abscesses. Ureteral fistulæ are to be distinguished etiologically as congenital, traumatic, and spontaneous. In twenty cases an operation was performed, only ten of which were successful.

TORSION OF THE PEDICLE IN OVARIAN CYSTS.

KÜSTNER (*Centralblatt für Gynäkologie*, 1891) has made a number of observations bearing on this interesting subject, and differs from other authors in his explanation of the etiology. In his last thirty-six ovariectomies he found in fourteen cases (38.8 per cent.) torsion of the pedicle up to at least 180°. Rokitsansky records 13 per cent., Thornton 9.5 per cent., Olshausen 6.3 per cent., and Horwitz 23.2 per cent. He explains the greater frequency of this complication in the Dorpat clinic by the fact that in most

found composed of two parts, one the uterus with a living fœtus, the other, probably, an ectopic fœtus. Upon laparotomy, a dead fœtus was found in the abdomen, which had developed in the posterior layer of the broad ligament; it was removed and the sac stitched to the abdominal incision. The next day labor came on and the intra-uterine fœtus was delivered; the patient recovered, the sac being drained and irrigated by an antiseptic fluid. The case is of an especial interest, as one in which intra- and extra-uterine pregnancy occurred concurrently.

THE TREATMENT OF PREMATURE DETACHMENT OF THE NORMALLY SITUATED PLACENTA.

FOUR cases of this abnormality are reported by MEYER (*Correspondenzblatt für Schweizer Aerzte*, No. 7, 1891). His experience leads him to believe that these cases are best treated by avoiding the rupture of the membranes, thereby maintaining the tension of the uterine muscle and preventing bleeding, while the physician should watch his patient until dilatation is so far advanced that speedy labor is possible. These cases demand close attention. When the mouth of the uterus is as large as a dollar, and the cervix is obliterated, the membranes may be ruptured if the condition of the patient justifies it; active measures may be taken to terminate labor after delivery. Special precaution should be taken to empty the uterus of all its contents, and to bring about firm uterine contraction.

PERNICIOUS VOMITING AND PTYALISM OF PREGNANCY AS HYSTERO-NEUROSSES.

AHLFELD advances the theory, in the *Centralblatt für Gynäkologie*, No. 17, 1891, that pernicious vomiting and ptyalism of pregnancy are hystero-neuroses of reflex nature. He has treated such cases successfully by measures adapted for the cure of neuroses, removing all possible irritants from the patient, and using sedatives addressed to the nervous system.

FETOR OF THE LOCHIAL DISCHARGES.

BOXALL (*Practitioner*, No. 5, 1891) has conducted researches upon 640 patients to determine the relationship existing between fetor in the lochial discharges and septic infection; six deaths occurred from sepsis among these patients; he concludes, from his observations, that septic infection may take place without fetor and that fetor also may occur without sepsis or fever. Fetor is most frequent in cases where the tissues are bruised and torn, and, therefore, in primiparæ and operation cases.

It is generally but not invariably associated with fever, but in such cases the fever almost always precedes the fetor by a considerable interval. While the presence or absence of fetor is a very uncertain guide to the presence or absence of sepsis, still it indicates the failure to maintain local asepsis, and vigorous antiseptic measures should be at once instituted. The vulva and vagina should first be cleansed and the uterus not be entered unless it is absolutely necessary.

factory. It is not entirely devoid of danger, and is not capable of successful application by the general practitioner. "It may be inferred," he adds, after citing fourteen successful laparo-hysterectomies out of fifteen cases, "that I have found nothing sufficiently curative in electrolysis to make me lay down my knife and never take it up."

INTESTINAL OBSTRUCTION AFTER OVARIOTOMY.

ANDERSON and HANDFIELD JONES (*Lancet*, 1890) report a case in which obstruction occurred seventeen days after operation. The abdomen was reopened three days later and a strong adhesion was found, attaching a coil of small intestine to the anterior abdominal wall. It was separated, the collapsed coil dilated, and the obstruction was overcome. The patient continued for a short time to have fecal vomiting, but eventually recovered. The writers distinguish two forms of obstruction following abdominal section, the first being almost immediate, the second developing after convalescence. In the first the symptoms are masked by those of peritonitis, and a secondary operation is usually fatal; in the second the diagnosis is easier and an operation promises relief. A second case is reported in which the obstruction was relieved twenty-five days after the primary operation.

COLLAS (Thèse de Paris, 1891) has collected twenty-three cases, eighteen of which followed ovariectomy. In eight cases a secondary operation was performed, four being successful. In fifteen the actual condition was only revealed at the autopsy. The symptoms of obstruction usually developed within ten days after operation, but in one instance six years elapsed. Peritonitic adhesions were the usual factors. The symptoms appeared suddenly and were not relieved by palliative treatment. The writer's deduction is that laparotomy offers the only positive means of relief.

THE TREATMENT OF OSTEOMALACIA BY CASTRATION.

HOFMEIER (*Centralblatt für Gynäkologie*, No. 12, 1891) reports the case of a virgin, aged thirty years, who had osteomalacia of three years' standing, the disease being progressive at the time of operation, as shown by the presence of severe pains in the pelvic bones, inability to walk, and marked pelvic deformity. Menstruation regular and painless. Four weeks after removal of the ovaries the patient could walk without assistance, and the pains were much less severe. She received cod-liver oil and peptonate of iron; six weeks later she felt quite well, had no pain, and could walk a long distance. The pelvic organs were normal. The ovaries were atrophied, as in a woman after the menopause, and presented a similar appearance microscopically, only a few ovisacs being seen. The case was interesting, not only because the patient was a virgin (hence pregnancy could not be regarded as an etiological factor), and there was no disturbance of menstruation, or evidence of pelvic congestion.

As regards the effects of castration under such circumstances the writer admits, with Fehling, that it is impossible to give a satisfactory explanation. It may be due to some reflex action upon the vasomotor nerves supplying the nutritive vessels of the pelvic bones, the disease itself being regarded as a tropho-neurosis of the bones directly dependent upon ovarian activity. This

of the cases inflammatory adhesions existed. In the majority of the cysts of the right ovary the torsion was toward the *left*, in those of the left ovary toward the *right*. His explanation is as follows: As soon as the tumor rises out of the pelvis and comes in contact with the abdominal wall it tends to fall forward, displacing the uterus backward. The ovarian ligament is now put on the stretch and crosses the tube, so that when the tumor lies in contact with the abdominal wall there is really a torsion of its pedicle to the extent of 90° , which is usually overlooked at the time of operation. If the pedicle is small, and the abdominal wall relaxed, changes in the centre of gravity of the tumor are readily produced by changes in the position of the patient; when she lies upon her left side it tends to rotate from right to left, since the infundibulo-pelvic ligament (which is its principal attachment) extends from the posterior wall of the pelvis anteriorly from right to left. The reverse is the case when she lies on her right side. This torsion is probably only temporary. After the neoplasm occupies the abdominal cavity the pressure of the intestines upon its posterior surface during peristalsis tends to increase the existing torsion; this pressure on the right side is exerted most upon the left side of the tumor and *vice versa*. This theory was supported by a case of double ovariectomy of the writer's, in which the pedicle of the left tumor was twisted 180° to the right, and that of the right to the left.

THE TREATMENT OF UTERINE FIBROIDS ACCORDING TO APOSTOLI'S METHOD.

Two recent communications by well-known and successful abdominal surgeons are of considerable interest from the different conclusions at which the writers arrive.

KEITH (reprint from *British Medical Journal*) reports further progress in the electrical treatment of fibro-myomata. During the last three years and a half he has operated only upon fibro-cystic tumors, and believes that with care there ought never to be any doubt regarding the selection of proper cases. The best results are obtained in the case of small bleeding tumors of recent origin, which require shorter treatment than the old, large ones. He summarizes as follows: "This treatment *almost always* relieves pain. It *almost always* brings about diminution of the tumor—sometimes rapidly. It *almost always* stops hemorrhage—sometimes rapidly. The results are *almost always* permanent, and the growth of the tumor, if it be not lessened, is stopped. The general health is immensely improved. By '*almost always*,' I mean nineteen cases out of every twenty."

HOMANS (*Boston Medical and Surgical Journal*, 1891) records the results of his experience with the electrical treatment of uterine fibroids since December, 1887, including thirty-four cases, the subsequent histories of which were carefully traced. Of these the principal results noted were relief of pain and hemorrhage, and improvement in the general health. In ten cases the tumor continued to grow, in sixteen no change was noted, and in only two was there a marked diminution in its size; in the latter the menopause appeared soon after the cessation of the treatment. In general, he regards the treatment as merely symptomatic and rather unsatis-

most frequently observed. Since the pelvic symptoms usually absorb most attention, the cardiac complication is often overlooked. Among 419 women who were examined, 110 (26 per cent.) had mitral disease; of these, 55 per cent. had erosions of the cervix, 43 per cent. prolapse of the ovaries, 38 per cent. displacements of the uterus, and 43 per cent. menorrhagia or metrorrhagia. [We are forced to believe that the writer exaggerates the frequency of heart lesions in women with pelvic troubles, and would offer in support of this criticism the fact that in institutions like the New York State Woman's Hospital, in which the condition of the heart is carefully noted before operations, no such proportion has been observed. If this fact were well established, the number of gynecological operations, both in private and hospital practice, would be diminished at least one-half.—ED.].

VESICAL PAIN AS A SYMPTOM OF PYONEPHROSIS.

GUYON (*Centralblatt für Gynäkologie*, No. 15, 1891) reports two cases bearing upon this question. In one the extreme tenderness of the bladder in making pressure over the fundus, and in introducing a sound, the amount of vesical tenesmus, and the purulent character of the urine, seemed to justify the inference that the condition was primarily cystitis. Cystotomy was performed, and the pain was promptly relieved. The kidneys, which had previously been so large that they could be palpated, and were quite sensitive to pressure, rapidly diminished in size.

In the second case, in which the presence of enlarged kidneys, fever, and pyuria pointed to an existing pyonephrosis, cystotomy was followed by a disappearance of the symptoms, although the kidneys still remained large. The writer's deduction is that, as renal affections may be secondary to vesical inflammation, so the former may be relieved by treating the latter. [The writer's conclusions would be more valuable if his premises were more trustworthy. It is not clear that he possessed sufficient evidence upon which to base a reliable diagnosis of pyonephrosis. It would seem as if the disease in both instances was situated *below* the kidneys. Under similar conditions we recently made an explorative lumbar incision, and punctured the supposed pyonephrotic kidney, but found no pus. Subsequent observations showed that the symptoms were due to metritis. The recommendation to make an artificial vesico-vaginal fistula is none the less a good one in a doubtful case.—ED.].

EXTIRPATIO UTERI SACRALIS.

Under this term CZERNY (*Centralblatt für Gynäkologie*, No. 16, 1891) describes the operation of removing the uterus after resecting the sacrum, as practised by him in three cases. His technique is as follows: The patient being on the left side, an incision is made along either side of the sacrum. The coccyx, fifth sacral vertebra, and a portion of the fourth, are removed, osteoplastic resection not being recommended, since it retards the healing process. The peritoneum is divided, the coccyx is drawn downward, and the broad ligaments are ligated. The bladder is dissected off from above. The peritoneal wound is finally closed with catgut. The operation consumes at least two hours, and the healing process is slow; its advantages are not great, and it is

theory receives additional support from a similar case reported by Truzzi. Fehling has collected twenty other cases of castration for osteomalacia, in none of which was there a failure on the part of the operator to secure at least a temporary benefit.

PARALYSIS FOLLOWING SUBCUTANEOUS INJECTIONS OF ETHER.

EBERHART (*Centralblatt für Gynäkologie*, No. 12, 1891) reports the following interesting case, which is of considerable interest to laparotomists, since ether is frequently used hypodermatically as a cardiac stimulant in cases of collapse during abdominal section.

In the course of an operation upon the cervix and perineum Eberhart's patient suddenly collapsed, whereupon two injections of ether were given, one on the anterior, and the other on the posterior aspect of the right forearm. The following day the patient had extensor paralysis of the middle, ring, and little fingers of the right hand, which disappeared in six weeks under faradization. It was inferred that a branch of the radial had been affected. Similar cases have been reported by Heymann, Mendel, and Remák; the latter attributes the paralysis to the direct irritation of the peripheral nerve by the ether. [We have long held the opinion that ether, although one of the most rapidly-acting cardiac stimulants, is too irritating for hypodermic use, even in emergencies in which it is invariably so employed. Even if paralysis does not result, persistent localized pain, paræsthesia, dermatitis, and abscesses are not infrequent results. We have found that deep injections of camphorated oil (one part to four), as recommended by the writer, were equally efficacious, and much less irritating.—ED.].

CYSTOPEXY.

TUFFIER (*Centralblatt für Gynäkologie*, No. 15, 1891) reported at the Société de Chirurgie several cases of cystocele treated by cystopexy, the technique of the operation being as follows: The bladder was first dilated with five ounces of boric acid solution, an incision two and one-half inches long was made in the hypogastrium, and a couple of catgut sutures were passed through the edges of the wound and through the superficial muscular layer of the anterior wall of the bladder. The abdominal incision was closed in the usual manner, and the patient was catheterized during the first week. In another case the bladder was suspended by four silk sutures, which included the serosa only, and were not passed through the skin.

Tuffier had operated thrice successfully by the extra-peritoneal method (as in epicystotomy), in one instance performing hysterorrhaphy, cystopexy, and anterior colporrhaphy upon the same patient. [This operation impresses us as being rather heroic treatment for a minor ailment. In the discussion of the paper Verneuil, Pozzi, and Richelot took the same ground. The same procedure was suggested and carried out by Dr. Henry Byford, of Chicago, at least two years ago.—ED.].

THE RELATION OF HEART LESIONS TO PELVIC DISEASE.

NEVIUS (*Centralblatt für Gynäkologie*, No. 15, 1891) calls attention to the frequent coincidence of cardiac and pelvic disease, mitral stenosis being

creases every day as the pathogeny of the affections are better known, is the class of reflex asthmas in general; these are the cases in which the bulbous irritation does not leave the broncho-pulmonary filaments of the pneumogastric. The bulb is then impressed by an excitement springing from all the peripheric branches of the vagus, but again from the other nerves—as the trigeminus and the cutaneous nerves—so that nasal asthma, pharyngeal asthma, amygdaline, gastric asthma, and cutaneous asthma belong to the category of dyspnœas. Nasal asthma has only been known a few years; Voltolini, in 1874, published the first facts relating to mucous polypi determining the approach of transient dyspnœa. Mucous polypi are rare in children; but, on the contrary, adenoid tumors are very frequent and a usual cause of nasal asthma. Hypertrophic rhinitis is also a frequent cause; this may be a primary disease or follow successive attacks of acute coryza, or infectious fevers, as measles and typhoid fever; it may be secondary to another nasal lesion, malformation of the nose, deviating thickness of the partition, foreign bodies, affections of the naso-pharyngeal canal, catarrh, and adenoid growth. More than this, this rhinitis is at times connected with diseases which attack the stomach (Boucharde, Ruault), the intestines (Secchi, Buck), genital apparatus (J. Mackenzie, Joul).

With such a child, predisposed to bulbous irritability, either by diathesis or heredity, and to nasal erectibility following the preceding lesions, an attack of asthma may be brought on by congestion following cold, by the action of vegetable or animal powders, by the influence of odorous matters, by the contact of a probe on the pituitary gland, by an untimely nasal irrigation, and by remote causes, stomachic, intestinal, or genital excitations.

The treatment recommended for the attack is fumigation by belladonna cigarettes, henbane, or the leaves of datura, stramonium, nitre paper, inhalations of oxygen, or ioduret of ethyl, but in many cases the hypodermic exhibition of morphine will be required to produce even momentary relief. In a general way, opium ought to be very prudently used with children; belladonna is much safer and can be used longer. Bretonneau and Guersant mix one centigramme of the extract to one centigramme of the powder of belladonna, giving this each day and continuing for some time. The tincture of lobelia inflata may be given in a dose gradually raised from 20 to 100 drops. Moncorvo remarks that the endurance of children for the treatment permits him to raise the dose 10 and 12 grammes in twenty-four hours. Blache has obtained excellent results from tincture of *grindelia robusta*, which he gives to children in doses of from 15 to 60 drops. Inhalations of vapor of pyridine, advised by M. Sée, have helped Blache to lessen the force of the attack. According to Laborde and Daudrie, this substance lessens excito-motor force, dilates peripheral vessels, and has a paralyzing action on the vaso-constrictor nerves; hence, it increases the fulness of respiration, at the same time the respiratory movements regulate themselves and diminish in frequency. The curative treatment of asthma limits itself to the almost exclusive use of iodine, particularly the iodide of potassium. The anti-dyspnœic effects of this agent on the brain, and particularly on the bulb, are certain; Binz states that it paralyzes the nervous functions and produces narcotism; in every case it moderates the exciting power of the vital centre and regulates the distribution of the nervous influx.

only to be preferred in complicated cases—stenosis of the vagina, disease of the parametric tissues, etc.

MÜLLER (*Correspondenzblatt für Schweiz. Aerzte*, Bd. xxi., 1891) has performed the operation with success in three instances. The disadvantages of the operation are the necessary external incision and the preliminary separation of the rectum, and slow convalescence due to the size of the wound. It is sufficient to make an incision from the lower end of the sacrum to a point half an inch from the anus; it is only necessary to remove the coccyx, which will leave a much smaller wound. The advantages of the method are the perfect view of the field of operation, even in complicated cases, the possibility of controlling hemorrhage, and of avoiding injury to the uterus; finally, the peritoneal cavity is more easily and exactly closed. It is particularly applicable to cases of advanced carcinoma.

UNIQUE CASE OF FOREIGN BODY IN THE VAGINA.

SZIGETHY (*Orvosi Hetilap*, No. 52, 1890) reports the case of a woman, aged seventy-five years, who, thirty years before, in order to support a prolapsed uterus, introduced into the vagina a ball of string previously dipped in wax. This entirely relieved her, and was worn without discomfort, so that she forgot its existence, when it was forced out of place by a violent effort. When extracted, with some difficulty, it measured seven inches in circumference, and was covered with mucus, but otherwise unchanged.

PÆDIATRICS.

UNDER THE CHARGE OF

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ASTHMA OF CHILDREN.

R. BLACHE (*L'Union Médicale*, 1890, No. 133) defines asthma as a bulbous disease, in which attacks are produced by impressive irritations of the vagus or peripheral nerves, particularly the trigeminus; the reflex action manifests itself by successive or simultaneous spasms of all the intrinsic inspiratory muscles, intercostals, scalenæ, trapézii, etc., and by a tetaniform contraction of the diaphragm.

Blache thus classifies the disease into three forms: Pneumo-bulbous asthma, essential or nervous asthma, emphysematous or alveolar asthma, catarrhal or bronchitic asthma.

Nervous asthma governs all asthmatical pathology of children. A class of asthma in infantile pathology which holds a place whose importance in-

the second a boy born of neurasthenic parents, whose mother suffered from nervous prostration and comatose conditions; during the labor her conduct was that of a person suffering from acute mania.

Case I. presented the first symptoms when he was a week old. The convulsions, three in number, were slight and lasted two or three minutes; but they increased in frequency from day to day, so that by the fourteenth day they were 70 in twenty-four hours; on the fifteenth day, 75; on the sixteenth, 79; on the seventeenth, 80; on the eighteenth day the intervals began to lengthen, and there were only 50 on that day, and on the next day but 8 light convulsions occurred; during the next five days they grew continuously less and less and eventually disappeared.

Total number of recorded convulsions, 366. During the entire period the patient took nourishment well, his appearance remained good, and his weight increased nearly two pounds. Medically he received a mixture of subnitrate of bismuth and deodorized tincture of opium, to control a few thin, copious passages from the bowels. To control convulsions, 2 grains of bromide of sodium, increased to 10 grains in twenty-four hours, were given.

Case II. weighed eight and one-half pounds at birth; the greatest circumference of his head was 41 cm.

On the twenty-first day he had four well-marked convulsions; the spasms commenced at first in the hands and feet, with congestion of right hand and face; as the spasm passed the part became pale and the spasms would attack those parts that were reddening; during attacks the respirations were much impeded, there being twenty- and thirty-second pauses in the act; occasionally there would be a minute when the child did not breathe. The total number of convulsions for four days reached the remarkable total of 183. The fontanelles were tense, and measurements showed that the greatest diameter had increased from 41 cm. to 44 cm.; the fontanelles continued moderately tense and the bones widely separated for two days after the convulsions ceased.

The child received oleum ricini and small doses of bromide of sodium, as indicated.

Eighteen months later the boy was fat and well.

Note to Contributors.—All contributions intended for insertion in the Original Department of this Journal are only received *with the distinct understanding that they are contributed exclusively to this Journal.*

Contributions from the Continent of Europe and written in the French, German or Italian language, if on examination they are found desirable for this Journal, will be translated at its expense.

Liberal compensation is made for articles used. A limited number of extra copies in pamphlet form, if desired, will be furnished to authors in lieu of compensation, *provided the request for them be written on the manuscript.*

All communications should be addressed to

DR. EDWARD P. DAVIS,

250 South 21st Street, Philadelphia.

Asthmatics presenting hyperæmia of the nasal mucous membrane are more easily affected with iodism. In cutaneous asthmas iodine may also be contra-indicated as aggravating the skin condition. At times the emaciation and loss of strength make it necessary to interrupt the treatment. Pyridine by aspiration, tincture of grindelia, arsenic, and ærotherapy by compressed air are, then, the only means which remain at the disposition of the practitioner. The iodine treatment is applicable to non-diathetic asthma; it is contra-indicated when the disease has a telluric or hereditary origin—for example, in the arthritic or gouty—a medication favoring incomplete nutrition or modifying the morbid secretions will be indicated. Asthmatics tainted with paludalism will require quinine in combination with iodide of potassium.

Blache agrees with Simon that the value of certain health resorts cannot be overestimated; the former gives preference to the waters of Mont-Doré, stating that their sedative and decongestive properties have produced good results, particularly in the pneumo-bulbous form; in herpetic asthma children as well as adolescents will find the sulphurous medication good. Bigorre, Saint-Honoré, and Alevard may be recommended.

REMOVAL OF A STONE WEIGHING 365 GRAINS BY VAGINAL CYSTOTOMY, FROM THE BLADDER OF A CHILD SIX YEARS OF AGE; URETER INJURED; OPERATIONS FOR CLOSING THE BLADDER DIFFICULT, BUT ULTIMATELY SUCCESSFUL.

In the *Pittsburgh Medical Review*, 1891, REAMY, of Cincinnati, records a remarkable case, in which, after the removal of a stone weighing 365 grains, *per vaginam*, it was necessary to perform four operations to close the resulting vesico-vaginal fistula, which was half an inch in length. The stone would have been removed by the supra-pubic operation if the operator had realized its size. The urethra was dilated to the size of the little finger; no paralysis followed.

The smallness of the vagina, together with the fact that the child was quite fat, made the operation for closure most difficult; and at the fourth operation the parts were much altered, considerable sloughing had occurred, and incrustation with urine salts; the edges of the wound were everted, ragged, and spongy.

The left ureter was seen to be discharging urine from the wall of the fistula. With much difficulty the ureter was dissected up, the mucous membrane of the bladder cut away sufficiently to uncover it; the free end of the ureter, liberated by the dissection referred to, was not cut off, but turned into the bladder. Seven No. 30 silver wire sutures were introduced into the fistula and allowed to remain two weeks; upon removal union was perfect. Though Parvin, Campbell, and others have turned an exposed ureter into the bladder, this is probably the first case in which this manipulation has been successful in a subject so young.

TWO CASES OF EPILEPTIFORM CONVULSIONS IN EARLY INFANCY.

BISSEL (*Journal Nervous and Mental Disease*, 1891) has observed two cases in very early infancy: the first a boy born of healthy parents, and

SCOTT'S EMULSION

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PLAIN COD LIVER OIL.

Plain Cod Liver Oil is *indigestible, deranges the stomach, destroys the appetite, is not assimilated*, and in a majority of cases is detrimental to the patient.

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DISEASES OF THE URIC ACID DIATHESIS.

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DOSE.—*One or two teaspoonfuls four times a day (preferably between meals).*

Urinary Calculus, Gout, Rheumatism, Bright's Disease, Diabetes, Cystitis, Hematuria, Albuminuria, and Vesical Irritations generally.

We have had prepared for the convenience of Physicians *Dietetic Notes*, suggesting the articles of food to be allowed or prohibited in several of these Diseases.

RHEUMATISM.

DIETETIC NOTE.—A fruit and vegetable diet is most favorable for patients with chronic rheumatic troubles.

Allowed.—Beef and mutton in moderation, with horse-radish as a relish; fish

and eggs, green vegetables and fruit, especially lemons. The skimmed milk diet has been advocated by some authors.

Avoid.—Starchy and saccharine food; all malt liquors, wines and coffee.

These *Dietetic Notes* have been bound in the form of small perforated slips for Physicians to distribute to their patients. Mailed gratis upon request, together with our latest compilation of case reports and clinical observations, bearing upon the treatment of this class of Diseases.

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The flesh of all children fed alone on any other Milk Foods (containing as they do 90 to 94 per cent. of cereals), is soft and flabby, because they do not contain sufficient nitrogenous elements, and the children thus nourished will in consequence quickly collapse when attacked with any serious complaint.

We respectfully request Physicians who are prescribing these Foods to examine the flesh of the Infants and verify our statements.

We are so confident that our Foods are practically perfect as substitutes for healthy human milk that we will furnish gratis to any Physician who is now prescribing other Foods or cow's milk, sufficient of our preparations to enable him to judge of their dietetic value in perfect nourishing qualities, as compared with other foods for similar purposes.

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Londonderry SPRING *Lithia* WATER

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Transactions of the Fourth Annual Meeting of the American Climatological Association, held in the City of Baltimore, May 31st and June 1st, 1887. Baltimore; Printed by the Association, 1887.

The Classification of American Waters.

By A. C. PEALE, M. D., *Consulting Chemist, United States Geological Survey.*

There is a fashion in Mineral Waters as in most other things. Sulpho-Carbonated waters promise to come to the front in the near future, and at the present time Lithia Waters occupy a prominent place. I know of but one Lithia Water, however, in which the analysis shows enough Lithia proportionally to entitle it to a distinct and separate place on every scheme of classification; that one is from the *Londonderry Lithia Spring, of New Hampshire.*

FRANK BILLINGS, M. D., *Professor of Clinical Medicine and Clinical Diagnosis, Professor of Physical Diagnosis and Clinical Medicine, Chicago Medical College.*

Londonderry Lithia Spring Water Co.

CHICAGO, ILLS., April 18th, 1889.

Gentlemen: I have used the *Londonderry Lithia Spring Water* in many cases of chronic Gastroduodenitis, with marked relief to the consequent "Lithæmia," Myalgia, Neuralgia, etc. It is a splendid diluent, and is so pleasant that patients will take it in large quantities. A necessary thing when indicated.

Very respectfully, FRANK BILLINGS, M. D.

FROM E. E. DENNISON, M. D., *Surgeon R. C. S. Edinburgh, Scot., Licentiate College of Pharmacy, Ire.; Intern and Licentiate of Midwifery, Rotunda, Ire.; Surgeon Provincial Fever Hospital.*

"I have personally tried and tested the *Londonderry Lithia Spring Water* for the relief of a chronic rheumatism that has annoyed me for years, and can most heartily indorse it and recommend its continued use to that large class of patients afflicted with the manifold and varied aches developed by the presence of uric acid in the blood. Without compromising in any degree the nutritive functions or their harmony with the rest of the organic system, it seems to neutralize the poison in the blood, which is the germ of the mischief and the suffering. Every physician should know this water and take it into his confidence."

NORTHAMPTON, June, 1883.

HENRY M. FIELD, M. D., *Professor Therapeutics, Dartmouth Med. School, etc.*

Londonderry Lithia Spring Water Co.

NEWTON, MASS., Nov. 20, 1889.

Gentlemen: I feel under a sort of obligation to send you a word of unsolicited and favorable testimony respecting the value and virtues of your Lithia water. Some way, as I believe, for a general practitioner, I have seen an exceptionally large number of cases of that most tormenting affection, the slow and halting passage of a renal calculus from kidney to bladder. The tortured patient does not wish a repetition of such agony; the competent physician ought, pretty surely, to protect him from such repetition. Since my attention was first called to your Lithia water—several years ago—and I became satisfied respecting its pre-eminent power, I have used no other Lithia Water, and in the cases just characterized I depend upon the *Londonderry* invariably and often as a last resource. Thus far it has rendered so good an account of itself that I feel bound to make the account, which I render good. I trust to your discretion and sense of propriety as to any disposition you may make of this letter. Yours truthfully, HENRY M. FIELD, M. D.

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J. LINDSAY PORTEOUS,

M. D., F. R. C. S. *Ed.*

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The prescribed dose produces a feeling of buoyancy, and removes depression and melancholy; *hence the preparation is of great value in the treatment of mental and nervous affections.* From the fact, also, that it exerts a double tonic influence, and induces a healthy flow of the secretions, its use is indicated in a wide range of diseases.

NOTICE—CAUTION.

The success of Fellows' Syrup of Hypophosphites has tempted certain persons to offer imitations of it for sale. Mr. Fellows, who has examined samples of several of these, *finds that no two of them are identical*, and that all of them differ from the original in composition, in freedom from acid reaction, in susceptibility to the effects of oxygen when exposed to light or heat, *in the property of retaining the strychnine in solution*, and in the medicinal effects.

As these cheap and inefficient substitutes are frequently dispensed instead of the genuine preparation, physicians are earnestly requested, when prescribing the Syrup, to write "Syr. Hypophos. *Fellows*."

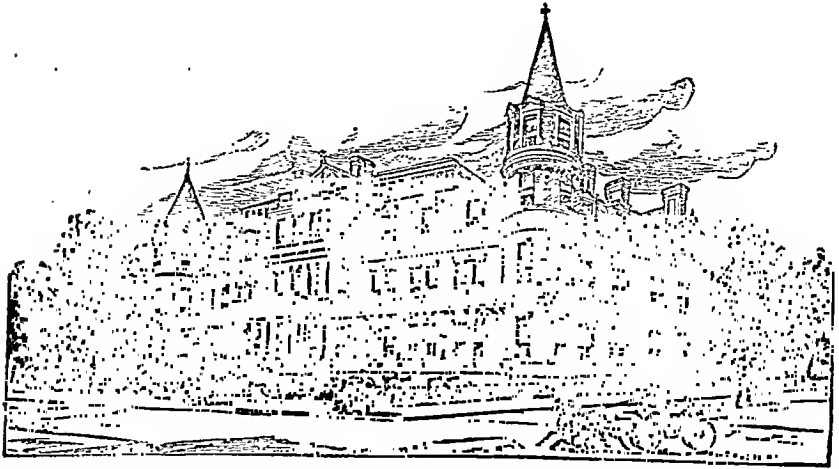
As a further precaution, it is advisable that the Syrup should be ordered in the original bottles; the distinguishing marks which the bottles (and the wrappers surrounding them) bear, can then be examined, and the genuineness—or otherwise—of the contents thereby proved.

Medical Letters may be addressed to :

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Have been treated within its walls. In consequence of the acquired experience, showing the advisability of such a course, arrangements have been made to enlarge the scope of the Sanitarium by establishing two additional departments—one for the Diseases peculiar to Women, and one for the Diseases of the Throat and Nose. The department of

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Will be under the immediate charge of Dr. E. L. TOMPKINS, who, as house physician and surgeon of the New York Post-Graduate Medical School and Hospital, and as one of the physicians of the Gynecological Department of the Demilt Dispensary, New York City, and further, during his service of two years as resident physician of the Hammond Sanitarium, has acquired large experience in Gynecological Medicine and Surgery. The department of

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Will be under the immediate management of Dr. AMORY CHAPIN, whose special education in the Medical Schools and Hospitals of Vienna, Paris, London and New York, during which time he had every facility for observing and treating cases of Throat and Nose Disease, is a guarantee of his qualifications.

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GARDNER'S SYRUP OF HYDRIODIC ACID.

(HYDROGEN IODIDE.)

INTRODUCED IN 1878.

This is the original preparation of Syrup of Hydriodic Acid, first brought to the attention of the medical world in 1878 by R. W. Gardner, the use of which has established the reputation of Hydriodic Acid as a remedy.

Numerous imitations, prepared in a different manner, and not of the same strength, and from which the same therapeutic effects cannot be obtained, are sold and substituted where this Syrup is ordered. Physicians are cautioned against this fraud.

The seventh edition of Gardner's pamphlet, issued in October, 1889, containing seventy pages of matter devoted to this preparation, its origin, chemical characteristics, indications, doses and details of treatment, will be forwarded to any physician upon application, free of charge.

GARDNER'S CHEMICALLY PURE SYRUPS OF HYPOPHOSPHITES.

Embracing the separate Syrups of Lime, of Soda, of Potassa, of Manganese, and an Elixir of the Quinia Salt; enabling Physicians to accurately follow Dr. Churchill's methods, by which thousands of authenticated cases of Phthisis have been cured. The only salts, however, used by Dr. Churchill, in Phthisis, are those of Lime, of Soda and of Quinia, and always separately, according to indications, *never combined*.

The reason for the use of single Salts is because of antagonistic action of the different bases, injurious and pathological action of Iron, Potassa, Manganese, etc., in this disease.

These facts have been demonstrated by thirty years' clinical experience in the treatment of this disease exclusively, by Dr. Churchill, who was the first to apply these remedies in medical practice. Modified doses are also required in this disease; seven grains during twenty-four hours being the maximum dose in cases of Phthisis, because of increased susceptibility of the patient to their action, the danger of producing toxic symptoms (as hæmorrhage, rapid softening of tubercular deposit, etc.), and the necessity that time be allowed the various functions to recuperate, simultaneously, over-stimulation, by pushing the remedy, resulting in crisis and disaster.

A pamphlet of sixty-four pages, devoted to a full explanation of these details and others, such as contra-indicated remedies, indications for the use of each hypophosphite, reasons for the use of *absolutely pure* Salts, protected in Syrup from oxidation, etc., mailed to Physicians without charge upon application to

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The fallacy of that theory having been demonstrated by its continued failure in actual practice, we seem to have swung to the opposite extreme of considering the patient as an indifferent receptacle of disease germs, into which it is sufficient to simply inject the appropriate germicide to effect a cure. So we have the various lymphs, antiseptic fluids, and other purely germicidal methods of treatment. But the results are showing that the *patient* refuses to be ignored as a factor in the case. The dead germs and the dead patient are buried together.

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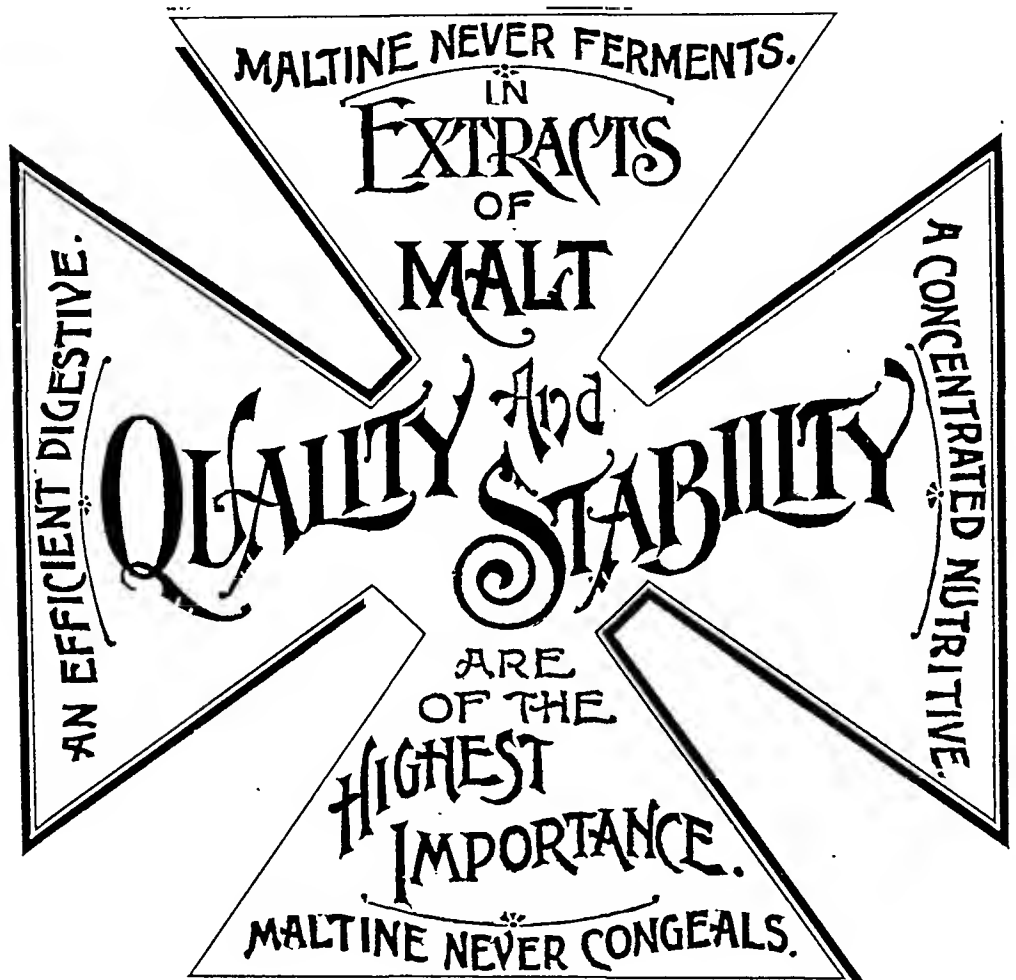
Thus the organism acquires additional strength with each step in advance, and the cure is finally complete.

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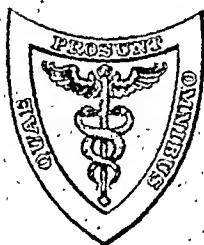
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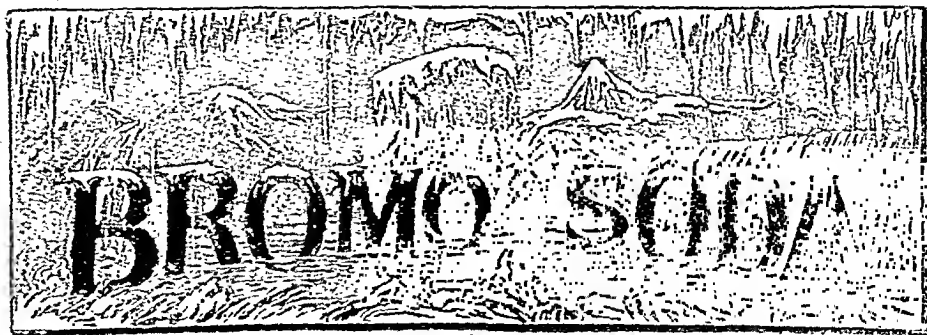
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OTOLOGY.

	PAGE		PAGE
Affections of the Ear in <i>Tabes Dorsalis</i>	198	Topography of the Normal Human Tympanum	200
Noteworthy Changes in the Nasal Mucous Membrane in a Case of Leukæmia	199	Reduplications of Tympanic Mucous Membrane	201
Cholesteatoma, Perforation of Shrapnell's Membrane, and Occlusion of the Tubes. An Etiological Study	199	Hæmorrhage into the Labyrinth in Consequence of Ordinary Anæmia	202

DERMATOLOGY.

Treatment of Anthrax by Carbolic Acid	202	Dermatitis as an Excretory Symptom	203
Aristol and its Uses	202	Scarification in Keloid and Hypertrophic Cicatrix	204
Traumatic Herpes Zoster	203	The Treatment of Rodent Ulcer with Resorcin Plaster-mull	204
Thiol in Skin Diseases, especially Dermatitis Herpetiformis	203	Pediculosis Pubis	204
Treatment of Urticaria by Iodide of Potassium	203	Lepra at Hanoi (Tonquin)	205

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

Carcinoma of the Larynx	205	A Case of Spasmodic Tic of the Soft Palate	208
Fractures of the Larynx and Trachea	207		

OBSTETRICS.

An Epidemic of Puerperal Fever	209	Complete Prolapse of the Pregnant Uterus	210
Rapidly Fatal Puerperal Infection	209	An Unusual Complication of Version	211
The Comparative Results of Hospital and Private Obstetric Practice	209	The Treatment of Suppuration during Puerperal Sepsis	211
Gonorrhœal Infection in the Mouths of the Newborn	210	The Pathology and Treatment of Eclampsia	212
Practical Results of the Examination of Mother's Milk	210	The Influence of Pregnancy upon Respiratory Metabolism	212
Soxhlet's Experience with Sterilized Milk, with Improvements in his Method of Sterilizing	210	Tumors of the Placenta	212
		Ectopic Gestation	212

GYNECOLOGY.

The Treatment of Pelvic Suppuration by Vaginal Hysterectomy	213	Etiology of Vesico-vaginal Fistula	214
Ventro-fixation of the Uterus with Opening of the Peritoneal Cavity	213	Gonococci in an Ovarian Abscess	214
The Mechanical Causes of Torsion of the Pedicle in Ovarian Cysts	214	Forcible Pressure in Abdominal Surgery	215
		Salpingo oophorectomy	215
		The Closure of Cervico-vesico-vaginal Fistula from Side of Bladder	216

PUBLIC HEALTH.

The Action of Common Salt on Pathogenic Organisms	216
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CONTENTS.

ORIGINAL COMMUNICATIONS.

	PAGE
Adenoma Uteri. By HENRY C. COE, M.D.	109
A Contribution to the Study of Pre-Columbian Syphilis in America. By JAMES NEVINS HYDE, A.M., M.D.	117
Nitrogen Monoxide and Oxygen for Anæsthesia in Minor Surgical Operations. By WILLIAM WALDO VAN ARSDALE, M.D.	131
The Etiology of Empyema in Children. By HENRY KOPLIK, M.D.	151
A Remarkable Case of Skin Disease. By J. FRANK, M.D.	164
Aseptic and Antiseptic Gynecological Surgery, as Practised at the Roosevelt Hospital. By GEORGE W. JARMAN, M.D.	169

REVIEWS.

A Treatise on the Diseases of the Nervous System. By Wm. A. Hammond, M.D.	176
Surgery: a Practical Treatise, with Special Reference to Treatment. By C. W. Mansell Moullin, M.A., M.D. Oxon.	178
Elements of Practical Medicine. By Alfred H. Carter, M.D. Lond.	180
A Guide to the Clinical Examination of the Urine. By Farrington H. Whipple, A.B. Harv.	181
'Cycling and Health. By Oscar Jennings, M.D. Paris, M.R.C.S. Eng.	181
Madeira and the Canary Islands. A Practical and Complete Guide, for the Use of Invalids and Tourists. By A. Samler Brown	181
Strathpeffer Spa; Its Climate and Waters. With Observations Historical, Medical, and General, Descriptive of the Vicinity. By Fortescue Fox, M.D. Lond.	181

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

	PAGE		PAGE
Arsenic as a Drug	183	Cactina	186
Opiates in Acute Peritonitis	184	Hæmorrhoids	186

MEDICINE.

Sudden Death from Spontaneous Rupture of the Aorta	187	Changes in the Sputum of Patients	190
Sudden Death from Rupture of Varices of the Heart	188	Alterations in the Bacilli Expecto- rated by Patients	191
Obstruction and Insufficiency at the Tricuspid, Mitral, and Aortic Orifices	189	Angina Pectoris	191
Malformation of the Heart and Great Vessels	189	Bacterium Coli Commune in the Pus from a Dysenteric Abscess of the Liver	192
		A New Test for Albumin and other Proteids	192

SURGERY.

Relapse of Hernia after Various Operations for Radical Cure	193	Catgut Infection of Wounds	196
The Seat of Puncture in Paracentesis Abdominis	195	Bottini's Method of Treating the En- larged Prostate	196
		Rupture of Urethra from Distention	197

of the term "benignant adenoma" to simple glandular hyperplasia has been made by those who look at the subject almost entirely from an anatomical standpoint, and arbitrarily group together conditions which present similar histological appearances, without due regard for their clinical differences. The importance of this will be evident later when we discuss the question of the possible relation between endometritis fungosa and cancer of the corpus uteri. Still more confusion has been caused by the numerous references in the literature to "polypoid adenoma" (Muckel), "channelled polypus (de Sinéty), etc., terms which are applied to simple mucous polypi or even to endometritis polyposa. Winckel, usually so lucid, is by no means clear on this subject, but seems to favor Klob's bewildering pathological division. Even such a forcible writer as John Williams might lead the incautious reader astray by causing him to infer that such polypi tend to become cancerous; though he specifies the cervical variety, other writers are not so careful. It is by no means certain that the specimen described by him was a true case of cancerous degeneration; and if it was, the development of epithelioma in the mucosa covering the surface of a so-called "glandular polypus" is a very different process from the transition of a true adenoma to carcinoma. Of course I refer always to intra-uterine, not to cervical, growths.

In the case of a mucous membrane which is so peculiarly the seat of localized and diffuse hypertrophies and pseudo-neoplasms as that which lines the uterine cavity, one must invariably apply the crucial test before deciding the question of the benignancy or malignancy of a certain growth. Is it confined to the mucosa in which it originated, or does it invade the deeper tissues? This it is often impossible to determine from an examination of curettings. Great injustice is done to pathologists in this respect. They are expected to decide positively regarding the character of an intra-uterine growth, when they receive only a few superficial fragments. Sometimes a lock of the patient's hair would be about as useful. No reliable microscopist would hazard a positive opinion in a doubtful case, unless he receives portions of the growth with the subjacent tissue; these can only be obtained by the use of the sharp curette. Reference will be made to this subject again under the head of diagnosis.

Briefly, then, I may state that I do not admit the existence of a distinct variety of intra-uterine neoplasm to which can be applied the term "benignant" as distinguished from "malignant" adenoma. I recognize only one variety—the adenoma malignum of Schröder, or diffuse papillary adenoma of Winckel, which I wish to show is anatomically the incipient stage of adeno-carcinoma; that as regards their clinical symp-

¹ "Cancer of the Uterus." Harveian Lectures for 1886; London, 1888, p. 75.

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OF THE MEDICAL SCIENCES.

AUGUST, 1891.

ADENOMA UTERI.¹

By HENRY C. COE, M.D.,

GYNECOLOGIST TO THE NEW YORK CANCER HOSPITAL, NEW YORK.

IN a former paper on "Malignant Disease of the Corporeal Endometrium" (*N. Y. Medical Record*, April 5, 1890) I referred at some length to "malignant adenoma," which I then regarded as an extremely rare condition. Subsequent study and clinical observation have convinced me that it is probably less infrequent than I formerly supposed, although it often escapes recognition in what may be designated as the pre-malignant stage of the disease. So much confusion exists in the nomenclature of diseased conditions of the endometrium that I am sure that you will pardon me for selecting such an apparently technical theme if I succeed in placing the subject in a clearer light. I have chosen the general title "Adenoma Uteri" in order to call attention to the errors that have crept into the writings of some of the most careful pelvic pathologists through their including under this head a number of different conditions, ranging from simple hyperplasia of the endometrium to adeno-carcinoma. For example, Fürst² described three varieties of adenoma, viz.: *adenoma uteri simplex*, or simple glandular hyperplasia; *adenoma uteri suspectum*, or destructive glandular hyperplasia; and *adeno-carcinoma*, or typical glandular proliferation with epithelial infiltration and general destruction of the tissues. As the latest authority on gynecology (Pozzi) properly remarks, the application

¹ Read by title before the Obstetrical Section of the Amer. Med. Assoc., May 6, 1891.

² *Zeitschr. für Geburtsh. u. Gyn.*, 1887, Bd. xiv. Heft 2, p. 364.

VOL. 102, NO. 2.—AUGUST, 1891.

adenoma, without clinical history, and the writer of the monograph on *Non-malignant Tumors of the Uterus in the American System of Gynecology* reproduces the figure, but in the context fails to recognize clearly that it is a true neoplasm, not a mere hyperplasia of the endometrium.

Mann¹ should be credited with having recognized this condition, as he examined and described a post-mortem specimen.

Bartolet² had a similar case in which the diagnosis of papillary adenoma was made during life from an examination of curettings.

Thomas³'s supposed cases are open to serious doubt. The very fact that one patient recovered after the curette had been used fourteen (!) times in five years, and that the other was curetted at frequent intervals during seven years, would at once exclude them from the present category. Moreover, only the curettings were submitted to microscopical examination.

Of Goodell's⁴ three cases of "villous degeneration of the endometrium," the second was probably ordinary endometritis fungosa; the first and third, from their clinical history, probably illustrated the transition from adenoma to adeno-carcinoma, as in my third case. Unfortunately, in neither of the instances was an opportunity afforded of examining the growth *in situ*.

Ruge and Veit⁵ were the first to make a careful study of adenoma, and Ruge presented a communication on this subject to the German Gynecological Society in 1888. Fürst alludes to it incidentally in the paper already quoted. My own more recent observations were reported in my paper of last year, to which reference has been made. I there mentioned two specimens which I had examined (Dr. Wylie's and Dr. Bache Emmet's), to which are now added two of my own. Dr. Freeborn, Pathologist to the Cancer Hospital, tells me that he has seen a fifth. In all of these the entire uterus was removed.

The most recent communication on this subject is by E. W. Cushing⁶ who clearly describes and figures the condition in question, recognizing its malignant character, as shown by its recurrence and eventual transition to the true carcinoma.

Beyond these I know of only five authentic specimens of papillary adenoma, described by any of the writers before mentioned, excluding all cases in which the diagnosis was founded upon the clinical history and the microscopical examination of scrapings alone. There may be

¹ Amer. Journ. of Obstetrics, January, 1878, p. 113.

² Philada. Med. Times, April, 1878, p. 354.

³ Diseases of Women, 5th ed., 1880, p. 570.

⁴ Lessons in Gynecology, 3d ed., 1887, p. 317.

⁵ Zeitschr. für Geburtsh. u. Gyn., Bd. vi., 1881, p. 302.

⁶ Annals of Gynecology and Pædiatry, May, 1891, p. 458.

toms they are practically identical, but that there is an important difference between the two as regards prognosis.

HISTORICAL.—Matthews Duncan is credited by Williams with having been the first to describe adenoma of the body of the uterus.¹ From his graphic description of the clinical symptoms, as well as from Slavjansky's careful report on the microscopical examination of the specimen removed, this would seem to have been rather a case of true adeno-carcinoma—the final, rather than the initial, stage of the disease. Duncan himself, with his characteristic acumen, concludes: "I can entertain very little doubt that, whether the disease is as yet truly malignant or not, it will before many months are passed, show the terrible characters of undoubted cancer." We read that recurrence took place almost immediately, the patient dying five months after he first saw her. In the light of our present knowledge few would have hesitated to perform a radical operation, instead of the palliative one which simply hastened the fatal issue.

The next contribution to our knowledge of this class of neoplasms was made by Breisky and Eppinger,² who report and figure a most instructive case, in which the former thoroughly curetted a uterus for recurring hemorrhage, removing a number of cauliflower masses, which presented the typical structure of adenoma. The hemorrhage reappeared, and four months later a second curetting yielded a fresh quantity of material, which was softer and more friable than that which had been removed on the previous occasion, and on microscopical examination indicated clearly the transition of the adenoma to adeno-carcinoma, the cross-sections of glands showing their lamina choked with epithelioid cells that presented a marked contrast to the cylindrical epithelium with which the tubes were lined. There was also an invasion of the deeper tissues by the neoplasm, which had not been noted before.

Klebs in discussing this paper credits Ackermann with reporting the first case of adenoma uteri, but it appears that the growth was confined to the portio vaginalis.

Schröder³ showed that he clearly recognized the condition, though he leaned toward the theory that there existed transitional forms between endometritis fungosa and what he denominated "malignant adenoma;" the latter, he noted, frequently developed into true glandular carcinoma. J. Veit⁴ soon after described and figured a case which showed the transition from adenoma to carcinoma.

Winckel describes and figures a museum specimen of diffuse papillary

¹ Edinburgh Med. Journ., vol. xix. p. 92.

² Prager med. Wochenschrift, Bd. ii., 1877, p. 78.

³ Krankheiten der weiblichen Geschlechtsorgane, 1879, p. 261.

⁴ Zeitschr. f. Geburtsh. u. Gyn., vol. i., 1877, p. 189.

uteri, which has just begun to infiltrate the deeper layer, but exhibits no histological evidence of cancerous change. The prognosis for a permanent cure, as in the former case, is excellent, although too short a time has elapsed since the operation to make the case valuable from a statistical standpoint.

CASE III.—Widow, aged sixty-three years. On entering the hospital she stated that she had passed the climacteric many years before, and had always enjoyed good health until seven months before, when she began to have a slight "show" at rare intervals, and her health commenced to decline without apparent cause. She had had no pain except severe backache for a few weeks. Slight inodorous watery discharge from the vagina. The os was dilated with tents, and the uterine cavity was thoroughly explored with the finger, revealing a diffuse cauliflower growth of the endometrium, portions of which were removed with the sharp curette, and examined microscopically. Diagnosis, adeno-carcinoma. Vaginal hysterectomy, with forcipressure. Discharged cured at the end of six weeks. Ten months later the patient had recurrence in the lumbar glands.

The specimen is clearly carcinoma of a particularly malignant form, that has deeply infiltrated the muscular tissue and has begun to ulcerate, rendering the prognosis much more unfavorable than in the two preceding cases. The after-history has confirmed the opinion which was then expressed, although at the time of the operation there was no evidence that the glands or perimetrial tissues were involved.

ANATOMY.—It is unnecessary to dwell upon the histological appearances of such a familiar growth as adenoma. I have already stated that *endometritis glandularis hyperplastica* is not adenoma at all, which is readily demonstrated anatomically by the fact that in the former the mucosa is generally hypertrophied, there is enlargement, but not marked proliferation of pre-existing glands, and the process is absolutely confined to the mucous layer; moreover the proliferation is always typical. That cancer may develop directly from such a condition is a question as yet *sub judice*; it may be affirmed by purely clinical observers, but when such careful students as Ruge and Veit declare that they have never yet met with an example of this transition, we must be content to regard it as not proven. On the other hand the development of carcinoma from true adenoma is unquestioned, as shown in Breisky's classical case; the malignancy of the neoplasm, even before the atypical proliferation of the glandular epithelium, so as to form solid columns, and the formation of outlying epithelial cell-clusters, is shown by its invasion of the submucous muscular layer and the disappearance of the interglandular fibrous tissue, in consequence of which adjacent glands are crowded together, forming glomeruli which Schröder has compared to a mass of earth-worms.

SYMPTOMATOLOGY.—I have no intention of claiming a distinct set of symptoms for the neoplasm under discussion, though Winckel has done so. On the other hand I would not affirm with Ruge that they are

others, but if so, they have been reported in such an imperfect way as to render them unreliable from a scientific standpoint.

In presenting these three uteri, removed by myself during the past year at the New York Cancer Hospital, I would call attention to the fact that they form a sort of ascending series. Case I. may be regarded as a typical specimen of circumscribed malignant adenoma, Case II. a beautiful example of the diffuse form of the same neoplasm, and Case III. illustrates the final stage of the disease—transition to adeno-carcinoma. As the histories have already been published, I shall present them merely in abstract for the sake of comparison.

CASE I.—The patient was a single woman, fifty years of age, who had reached the climacteric seven years before. She had had slight atypical hemorrhages for five years before I saw her, and had been curetted twice during the previous year with only temporary benefit. The scrapings had not been examined microscopically. Diagnosis, probable sarcoma. She entered my service at the Cancer Hospital in December, 1889, being then in good general health.

She had severe paroxysmal pain in the pelvis, which recurred every day at regular intervals, but had no vaginal discharge whatever.

Tissue removed by the curette was examined microscopically but without positive results. I could only decide that the condition was neither endometritis fungosa nor round-celled sarcoma, and hence was led to believe that I had to do with cancer of the corporeal endometrium, although the long duration of the symptoms and the remarkably good condition of the patient were against this theory.

The uterus was extirpated *per vaginam* with considerable difficulty, though not large, because of the contracted vagina and outlet. Forcible pressure was used. The patient made a good recovery and is now in perfect health, with no signs of recurrence. The anatomical condition is circumscribed papillary adenoma, neither does the microscope reveal any trace of transition to carcinoma. Yet the growth had begun to infiltrate the muscular layer, and the clinical symptoms, though of long standing, pointed unquestionably to its inherent malignancy. There is no doubt that a delay of a few months, with one or two more palliative operations, would have resulted fatally.

CASE II.—Widow, aged fifty-three years. One child and three miscarriages. Menopause reached three years ago, soon after which she began to have an irregular sanguineous discharge from the vagina with occasional hemorrhages. She said that she had a "polypus" removed six months before, after which the flow ceased for a time, but soon returned. No pain whatever until a few weeks before her admission to the Cancer Hospital in November, 1890. Was in robust health. Examination showed the uterus to be moderately enlarged, freely movable, and insensitive to pressure; the endometrium bled easily. Fragments of tissue removed with the curette were too superficial to allow of a positive diagnosis, except that the growth was probably malignant. Total extirpation of the uterus *per vaginam*, with forcible pressure. Normal convalescence, and patient discharged cured at the end of five weeks.

The specimen is a beautiful example of diffuse adenoma of the corpus

that every time that adenoma uteri is attacked with the curette it simply returns in a more malignant form; the use of the galvano-cautery may be less objectionable, but it is a blind procedure. "We have scotched the snake, not killed it."

There is no class of cases in which vaginal hysterectomy offers such good prospects of a permanent cure, as in those which form the subject of this paper. The operation is exceptionally easy, as the uterus is small and is perfectly movable, there is no involvement of the glands or parametria, the patient's general condition is good, and above all, the disease is *entirely* eradicated. It ought certainly to afford a surgeon more genuine satisfaction to remove a uterus which is the seat of pure adenoma that has not yet entered the cancerous stage, than to extirpate the entire organ for commencing epithelioma of the portio vaginalis, when the diseased tissue might have been excised by high amputation.

To conclude, the following deductions seem to be justifiable:

Benignant adenoma of the corpus uteri is a misnomer. Neither glandular hypertrophy of the endometrium nor so-called adenoid polypus is a genuine adenoma. The only true adenoma of the corpus uteri is essentially malignant both anatomically and clinically—anatomically because it infiltrates the deeper tissues, and clinically because it recurs after removal and eventually assumes a more malignant character.

Malignant adenoma is not at the outset identical with adeno-carcinoma, but may be regarded as the initial stage of the latter, having many of the same symptoms. Rapid recurrence after removal by the curette of an intra-uterine growth which does not appear to be distinctly malignant histologically, and has existed for a considerable length of time, should suggest the probability that it is adenoma, provided that the patient, although at the age when cancer of the corpus uteri is most common, does not have the foul discharge and cachexia attending advanced malignant disease.

A positive diagnosis is possible only after digital explorations of the uterine cavity and the removal with the sharp curette for microscopical examination of a bit of the suspected growth, with the subjacent muscular tissue.

As soon as the diagnosis of a malignant growth is reasonably certain total extirpation of the uterus should be performed without delay. Palliative measures simply favor the more rapid transition to carcinoma, when the prognosis as regards a permanent cure becomes much more doubtful.

never distinguishable from those of cancer. I believe that malignant adenoma is a distinct pathological condition which, although it inevitably tends to pass into carcinoma, is not in its initial stage carcinoma, and would call attention to the fact which is clearly shown by the histories narrated, that there are some essential points of difference. Thus, it is evident that cancer of the body of the uterus would not exist for from three to five years without the occurrence of such retrograde changes as would either destroy life from exhaustion, or would seriously affect the patient's health. After continuing for so long a time there would certainly be more severe pain, more profuse hemorrhages, a foul discharge, septic infection, and involvement of the glands and perimetrial tissues. Witness the contrast to Cases I. and II. presented by Case III. Furthermore, the negative evidence presented by the examination of curettings is of considerable value, since it is always easier to determine with the microscope the probable absence of malignant disease, than its presence.

DIAGNOSIS.—From a surgical standpoint I am not a stickler for the refinements of anatomical diagnosis in these cases. In proof of this I need only call attention to the fact that I performed total extirpation of the uterus in Cases I. and II., although by no means certain that I should find malignant disease, and was much relieved to find that my suspicions were justified. Such symptoms as those which I have mentioned, in a woman who has passed the climacteric, added to the fact that they rapidly recurred after thorough curetting, do not warrant further resort to palliative treatment. With the results of modern aseptic surgery before us, we are not justified in waiting until the diagnosis has been established beyond the shadow of a doubt, and the patient's health has been seriously undermined, before we decide upon radical measures.

PROGNOSIS.—As the history of the few *authentic* cases of adenoma uteri has shown, the course of the disease is usually slow and insidious, but, though less malignant than round-celled sarcoma and medullary carcinoma of the endometrium, its fatal termination is none the less certain. Sooner or later cancer is bound to develop with all its attendant evils, with which we are so familiar. The continued good health of the patient, her freedom from pain, local tenderness and a foul discharge should not deceive us. The end, though delayed, is inevitable.

TREATMENT.—Although maintaining a somewhat conservative attitude with regard to the question of total extirpation for cancer of the cervix, when it comes to cases of real or suspected malignant disease of the corpus uteri I would adopt the most radical measures. Fürst is right when he says that palliative treatment of the latter does more harm than good; it simply aggravates the trouble. I believe

lowing March. Ruy Diaz de Isla, a physician of Andalusia, stated that he had treated some of this company for syphilis, the symptoms of which had first appeared on shipboard before the landing. On the 14th of June of the next year Nicholas Scyllatius reported syphilis as prevalent in epidemic form. The great captain, Gonzales Fernandez de Cordova, soon after left Spain, and in a second Italian campaign against the arms of Louis XII., brought his Spanish troops in contact with the French. Oviedo not only stated that the disease was introduced into Europe from the West Indies by the fleets of Columbus, but added that he was personally acquainted with some of the navigators who had acquired the disease from this source; and gives the name of one of these sufferers, personally known to himself as also to their majesties of Castile. He is also authority for the statement that Cordova, when he was sent to Italy, had in his army persons who were known to be infected.

Six years after Columbus sailed from Hispaniola the devout Las Casas writes of his Indian converts that they freely admitted the prevalence of the disease amongst themselves long before the advent of the Christians; and that the latter were far greater sufferers from the pestilence than the natives themselves. Sir Hans Sloane, who visited the West Indies in 1687, Robertson, the historian, and others whose names are as well known, have, after careful research, expressed their belief in the American origin of the malady. In our own country, Professor Joseph Jones, of New Orleans, may be cited as a classical writer on this theme. His explorations in Kentucky, Tennessee, and elsewhere have led him to conclude that syphilis existed in this hemisphere at a remote period of the past; but even if prevalent in the crowded West Indian Islands at the time of their first visitation by Europeans, did not for that reason necessarily exist upon the Northern and Southern continents. He cites, on the contrary, John D. Hunter, who, after a long captivity among the Indians, declared that they suffered from the disease, but that they had contracted it after communication with the white race.

Two interesting papers have also been contributed to this subject by Dr. Gustavus Brühl, of Cincinnati, Ohio, which embody the fruits of considerable historic research. They contain several interesting arguments having an etymological basis in favor of the existence of pre-Columbian syphilis in the Western Hemisphere. The writings of Sahagun, Torquemada, Roman, Mendieta, Pane and others show as to New Spain—first, that the bodies of those affected with syphilis were interred, as distinguished from those dead of other disorders, which were cremated; second, that the infected were not deemed fit for religious sacrifices; third, that they were represented at the festivals; and fourth, that the disease was counted a punishment sent from the gods for the non-performance of religious rites and other offences. The author also shows that the Mexicans not only recognized the connection between

A CONTRIBUTION TO THE STUDY OF PRE-COLUMBIAN
SYPHILIS IN AMERICA.

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THE question whether syphilis prevailed upon the American continent previous to the close of the fifteenth century has a larger measure than the interest of the antiquarian. It is one not without significance for the present, and proposes a problem to modern pathology.

The historical facts upon which it has been sought to rest both the affirmative and negative answers to the question are so well known that the briefest summary of them must suffice for the present purpose.

The ancient literatures of China, India, Greece, and Italy contain unmistakable proofs of the fact that at an early period of the world's history, certain genital lesions were recognized as resulting from sexual contamination. Many of the systemic results of syphilis, not merely in these writings but in those of the Middle Ages, are more or less graphically described. These descriptions are, however, for the most part fragmentary and disconnected; and the conditions they represent are often assigned to other and various disorders; rarely, if ever, are they identified as the results of a previous infection of some particular part of the body. Between, however, the years 1492 and 1494 an epidemic of syphilis spread over France, Spain, Italy, Switzerland, the countries bordering on the Rhine, and other parts of Europe, which eventually became as formidable in its effects as it was general of diffusion. Its prevalence was greatly aided by the campaigns of Charles VIII. of France, who, in his expedition to Naples, led an army of between eight and ten thousand men into the plains of Italy. He crossed into Piedmont on the 8th of December, 1494. His army was officered by young men of aristocratic connections, leading the loosest lives. The rank and file, following the example of their dissolute commanders, were successively quartered in most of the larger Italian cities, and, in the license of unrestraint, did not hesitate to pillage Rome. As a consequence, syphilis was offered to the study of physicians on a broader scale than ever before. Its phenomena were now carefully noted and its earliest and later symptoms recognized as phases of the evolution of a single specific disorder. Fracastor wrote his poem; Isla, his treatise; Sydenham, his letters. The affection soon passed from beneath the uncertain shadows of the mysterious into the calm scrutiny of science.

On the 4th of January, 1493, the Admiral Christobal Colon, better known to us as Columbus, sailed with his company from the West Indies in the *Pinta* and *Nina*. They reached the shores of Europe by the fol-

FIG. 1.



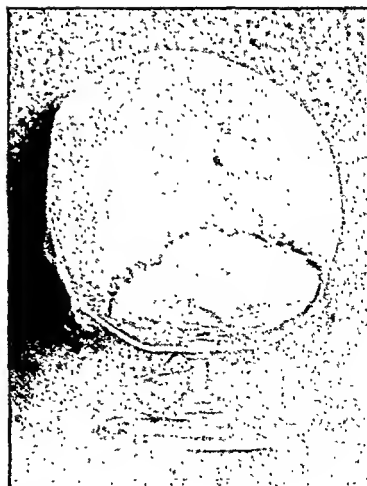
FIG. 2.



FIG 3



FIG. 4.



rado, about forty-five miles distant from Durango. In the process of exhumation of this skeleton the skull was found so far disintegrated that on exposure it at once crumbled to fragments. Fig. 6.

the earliest and later manifestations of the disorder, but distinguished between several types of the former, understanding also its remedial treatment far better than the Spaniards, even seeking thermal resorts for the purpose of securing relief. He quotes from seventeen Indian dialects, each of which has a primitive and native term for designating the disease, none of the terms thus employed suggesting their confrontation with a new malady, although soon after contact with the whites they were compelled to apply new names for many novel objects with which they were to become familiar. These new names either bear witness to the impression on their ears made by the speech of the Castilians, or describe some prominent feature of the object to be newly named, a rule distinctly observed by them in the case of diseases known to have been imported from Europe to America, as for example, measles and smallpox. The singular confusion existing in the Mexican language of the sixteenth century, of the terms employed to indicate ideas of power, divinity, and the special disease here under discussion, possesses an interest in view of the fact that this is recognized in the dialects of Quechua and Aymerás three hundred years before Pizarro conquered the capital of the Incas.

But to the inhabitants of the Northern part of the Western Hemisphere, the chief interest which to-day attaches to this question rests upon the discovery of bones which have been disinterred in different parts of the country, many of them of great age, presumed to be prehistoric, some of which exhibit traces of disease thought to be syphilis. Such are those exhumed by Professor Jones, who claims that some of those taken by him from the Indian cemeteries are the "oldest syphilitic bones in existence." Others have been disinterred in California, Colorado, and elsewhere within the boundaries of the United States. Only one who has had the singular opportunity of examining all these specimens can speak with authority upon the conclusions which their study justifies. In the pages which follow reference is had only to those either examined by myself or to those represented by portraits in my collection. The following list of photographs may be regarded as fairly representative of these collections:

No. 1. Two incomplete human tibiae from a mound in Alamada County, California, furnished me by the kindness of Dr. Billings, from the collection in the Surgeon-General's Office of the War Department, U. S. A.

No. 2. A group of tibiae and fibulae from a burial mound near St. Francis River, Arkansas, furnished me by the kindness of Professor F. W. Putnam, of the Peabody Museum of American Archæology and Ethnology in Cambridge, Mass. Figs. 2 and 3.

No. 3. A skull with other diseased and healthy bones, all from the same skeleton, from a burial mound in Colorado, furnished me from same collection. Figs. 4 and 5.

No. 4. Two tibiae, selected from other bones of a skeleton in my own collection sent to me by Dr. J. W. Brown, Mr. Thomas M. Trippe, and Mr. Mentzel, exhumed from a prehistoric burial site on the Animas River, Colo-

No. 8. Lower ends of femora with patellæ, tibiæ, and fibulæ, showing results of inflammation, probably syphilitic; surface of bones, especially of front of tibiæ, very irregular, with marked depressions and new growth of bone; general osteoporosis. Osteomyelitis; ossifying periostitis. Removed from a mulatto woman aged forty-one years. (Surgeon-General's Office.)

No. 9. Left tibia, the upper third of which presents subperiosteal necrosis and deeper fistulous passages; the middle third of the bone shows the same condition to a less extent; and in addition, especially on its posterior surface, an abundance of spongy osteophytes. From a white man, age unknown; disease supposed to be result of exposure; leg amputated above knee; patient recovered. (Surgeon-General's Office.)

No. 10. Right tibia; tibia osteoporotic throughout and ankylosed to astragalus. From a white man aged forty-five years; had his right foot hurt while jumping, when fourteen years of age; hurt again in 1866 by being

FIG. 7.



FIG. 8.



struck by a falling bar of iron. Inflammation ensued; amputation in lower third of thigh. Patient recovered. (Surgeon-General's Office.)

No. 11. The lower extremities of a clinical patient, lately applying for relief at the clinic in Chicago, affected with inherited syphilis in the right tibia, exhibiting marked deformity, produced by enlargement and antero-posterior curve. Fig. 7.

No. 12. A reproduction of the cuts employed by Fournier to illustrate the bone disease of inherited syphilis described by him as the sabre-blade deformity. (*Lame-de-sabre*.) Fig. 8.

Viewing as a whole the group of exhumed bones whose photographs have been studied, it is clear that the morbid changes they represent are due to forms of inflammation described by Professor Jones as "periostitis, osteitis, endosteitis, caries, sclerosis, and exostosis." "They are," using again the descriptive terms he employs, "thoroughly diseased,

Comparing the general features of the bones shown in these photographs with those elsewhere collected, figured, and described, as probably the seat of syphilitic lesions, I believe that they may be regarded as fairly representative of the entire group. For the purpose of readier comparison, I have also studied photographs of

No. 5. A left tibia, showing hyperostosis of the entire shaft, with some shallow depressions where it is supposed suppuration had occurred. The upper half shows abundant exostosis over all its surfaces, the joint being involved. Weight of bone thirty ounces. From a negro whose entire skeleton was involved in syphilitic changes. (Surgeon-General's Office.)

FIG. 5.



FIG. 6.



No. 6. Calvarium; the outer table showing numerous erosions, some large and deep, others small and superficial, which corresponded in the recent state with small pinkish gummata of the pericranium; a few perforations; many exostoses. The inner table shows many erosions and closely set osteophytes. From a colored man aged forty-two years. (Surgeon-General's Office.)

No. 7. Right tibia, showing marked nodular irregularity, resulting from gummatous tumors. The left tibia less strikingly affected with similar lesions. From a Saladoan. (Surgeon-General's Office.)

ulcerations," "marked eburnifications," and "reticulated ulcerations," in which an ulcer penetrated a network of periosteal deposit with an annular border.

If syphilis actually prevailed among the aborigines of the Northern part of the Western Continent, it is natural to conclude that with only that measure of therapeutic relief which they could command, inherited syphilis must have been proportionately prevalent. It is well known, too, that in the last-named form of the disease bone symptoms are much more frequently encountered than in the acquired form. Yet I have been thus far wholly unable to secure a photograph or a description of any bone in America that can be fully identified as part of a prehistoric skeleton with the lesions of inherited syphilis unmistakably apparent. There is no bone illustrating these conditions, whether historic or prehistoric, in the collection of the Surgeon-General's Office. Professor Putnam informs me that he has many tibiae of children exhibiting the curves to be seen in the condition described by Fournier as the "sabre-blade" deformity, and well illustrated in the photograph of a clinical patient lately shown before the class in Rush Medical College, Chicago. But in these curves the special changes described by Fournier, Taylor, Augagneur, Parrot, Ollier, Poncet, and others, often recognized in a general clinical experience, are not declared. There are no traces of the chronic or subacute, often symmetrical and multiple, simple or gummatous, osteo-periostites, and osteo-myelites, starting at the epiphyso-diphyseal junction, and producing the smooth or irregularly undulating annular tumors embracing the bone. Even the "massive distortions" described and figured by Fournier in his classical work on *Late Inherited Syphilis* differ to some extent from those here represented, though suggesting a resemblance in the general contour of the deformed bones.

In order to investigate this matter more fully, I selected for pathological examination the tibiae of the parts of a skeleton sent me from Colorado, not merely because they fully illustrate the general changes described by most authors as characteristic of prehistoric bones claimed to be syphilitic, but also because it is seriously claimed by the scientific men of special training who superintend the exhumation, that they antedate by a long period of time the relics of the Mound-builders and Cave-dwellers. The mode of their sepulture was different from that prevalent among the races indicated by these names, as also from that which has survived to our own day among the Zuñis.

Upon these bones, submitted to Dr. T. M. Prudden, of the laboratory of the College of Physicians and Surgeons of New York, I receive the following report:

"The bones were two apparently adult tibiae, both lower ends of which were absent, being apparently crumbled off. Both of the bones presented marked abnormalities which may be best described on the sepa-

enlarged, and thickened, with the medullary canal more or less completely obliterated by the effect of inflammatory action, with the surfaces eroded in many places." Again: "In many the medullary canals are equally involved with the periosteum." Some of these changes are bilateral, involving—if not equally, to some extent—bones of like name on the two sides of the body. In other cases several different bones of one skeleton are diseased.

The most conspicuous of the features common to the greater number, are the diffuseness, uniformity, and lack of sharp definition of the lesions, represented chiefly by hypertrophy rather than atrophy. The first question then at issue does not concern the existence of these tangible metamorphoses. It is reduced to the inquiry, Are these metamorphoses due wholly or in part to syphilis?

The distorted femur of the skeleton obtained from Colorado seems to have been the seat of an abscess. I have suggested to Professor Putnam that it may have resulted from traumatism by one of the triangular flints employed by the Indians as arrow-heads, wounding bone, periosteum, or adjacent tissues. I am under the impression that he is disposed to entertain the same view. In a sacrum and dorsal vertebra to be found in a collection of bones taken from a prehistoric cemetery in Madisonville, Ohio, the implements named are seen to have penetrated the osseous substance to the extent of about half an inch.

As to the other modifications of shape and tissue exhibited in this group of bones, there is a conspicuous absence of certain features which are to be expected in bone syphilis, and which are seen, however imperfectly, in the group of photographs of bones known to be syphilitic. Here are not the single or multiple, conical, roundish, or flattened, smooth, hard, pea- to nut-sized and even larger nodules which may be found in both the laminated and eburnated conditions. Here are not the circumscribed swellings, well or ill-defined, found at the distal extremities of syphilitic bones, as, for example, near the wrist when involving the radius and ulna. Here are not the atrophic areas whose definition is scarcely less remarkable than that of the tumefaction which preceded. Here is no suggestion of a poorly united fracture, no hint of a super-added "splint," no trace of a circumscribed or even diffuse gummatous involvement, leaving after degeneration, circinate, single, or multiple relics of the process. We search in vain for bone-cicatrices; for smooth or rough mamelonations of the surface, for localized sclerosis. We discover no centric rarefaction of the osseous tissue with a peripheral overgrowth. In the Madisonville collection, however, there are two tibiae suggesting the gummatous changes in the bones of the syphilitic subject, illustrated in the photographs (already shown) of the skull with numerous erosions, and of the bones of the negro subjects. Professor Jones describes also "rounded ulcerations with glazed surfaces," "tuberculated

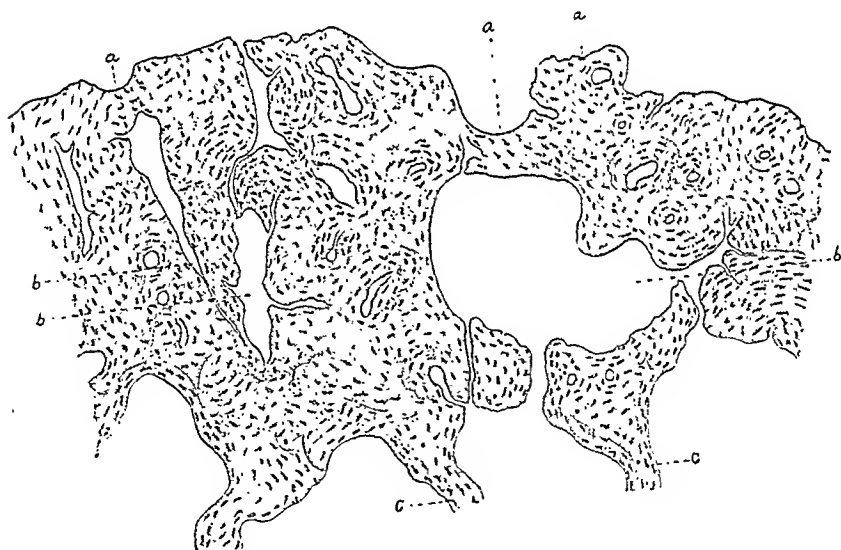
line, the compact substance is pierced by the cancellous tissue, which becomes continuous with the projecting osteophytes.

"Along the middle of the shaft, where it is most perfectly preserved, the cancellous tissue completely fills the narrow cavity.

"The *microscopical examination* of the trabeculæ of the cancellous tissue in both bones shows the usual appearances of such tissue, but the irregularity and apparent aimlessness of their grouping and arrangement indicate their formation under the influence of a chronic inflammatory process. Microscopical examination of the osteophytes shows the irregular grouping and relative positions of the bone cells and bone lamellæ, which is usually associated with such inflammatory structures. The microscopical examination of the more compact bone tissue from various places in the shafts of both bones shows the utmost irregularity in the arrangement, size, and direction of the Haversian canals and their surrounding lamellæ.

"The porous surfaces of the shafts show the eroded depressions, the irregular entrances for bloodvessels, and in places the closely grouped

FIG. 9.



Howship's lacunæ which indicate the formation and absorption of the superficial layers of bone under the influence of chronic periostitis. The appearance of a considerably magnified transverse section of the more compact bone of the right tibia, near its surface, is shown in Fig. 9.

"The articular surfaces of the knee-joint do not seem to have been the seat of chronic inflammatory changes. But, judging from the large osteophytic outgrowths about the upper end of the left tibia, it seems not unlikely that this joint was stiff.

rate bones. The lesions of the left tibia are more extensive than those of the right.

"The *left tibia*. The shaft of the bone is bowed considerably forward at its middle and lower portions. The shaft, which is nearly cylindrical, is everywhere greatly increased in thickness, measuring from 4 to 4.5 centimetres in diameter in all parts except at the lower end, where it is slightly smaller. The whole bone is very light in weight.

"About the articular end, at the knee-joint, the bone presents erosions, irregular losses of substance and numerous larger and smaller bony outgrowths—the latter being most marked about the front of the joint and especially about the seat of attachment of the ligamentum patellæ. The fibular articular surface is completely destroyed. The entire surface of the shaft is roughened and porous and beset here and there, especially along the lines of tendinous attachment, with larger and smaller rows and masses of the delicate bony outgrowths called osteophytes. These osteophytes are especially prominent along the lateral and posterior aspects of the shaft. Branching grooves in the surface of the bone and delicate projecting bony plates and spiculæ and ridges contribute to the roughness of the shaft.

"Transverse sections of the shaft of this bone at its middle third show that the bone, which from the outside appears to be largely hypertrophied, is a mere fragile cylindrical shell, the peripheral compact bone being almost everywhere thin and uneven, and the bulk of the shaft consisting almost wholly of irregular cancellous or spongy tissue.

"The more delicate central trabeculæ of the cancellous tissue, which apparently nearly or completely filled the narrow cavity have, except in a few places, largely disintegrated and fallen out with the lapse of time.

"Along many parts of the bone the cancellous tissue pierces the shell of compact bone—which though very thin in general encloses the shaft—and becomes continuous with the osteophytic outgrowths on the surface.

"The *right tibia* is smaller but heavier than the left. The shaft is in general irregularly ovoidal, its antero-posterior diameter in the upper and middle third being about 4 centimetres, its transverse diameter about 2.3 centimetres.

"The shaft presents, especially about its upper end, superficial erosions and osteophytic outgrowths similar to, but less extensive than those of its mate. The whole surface of the shaft is rough and porous.

"Transverse section between the upper and middle third shows an irregular inclosing shell of compact bone, from 1 to 5 millimetres in thickness. This superficial compact bone is in places riddled with larger and smaller very irregular Haversian canals; in places is quite dense and solid externally. On the posterior aspect of the bone along the oblique

caries or necrosis. There has been, so far as the bones show, simply such a general rarefying and formative osteitis with formative periostitis as to have produced the condition often described as spongy hyperostosis. There is no evidence whatsoever, so far as I can see, of the presence at any time of the more common and typical circumscribed nodular or gummatous lesions, which are alone characteristic of syphilis of the bones. There are none of those circumscribed local losses of substance, associated with more or less localized sclerosis, which speak for the former presence of gummata. On the other hand, there is, as is well known, a more diffuse and general inflammation of the bone and periosteum which not infrequently occurs in the tibia, and which is believed to be due to syphilitic infection. But even in this form of syphilitic bone lesion, the sclerotic rather than the rarefying character in the inflammation, as is the case here, is, I think, apt to prevail.

"That the individual was not the victim of any phase of hereditary syphilis which induced developmental malformations of these bones, is evident from the sufficiently well formed upper articular extremities.

"Still, again, a simple non-specific general rarefying and formative osteitis with formative periostitis leading to just such bone changes as are present here, and with a predilection for the tibia is of no very uncommon occurrence.

"On the whole, then, while I am disposed to think that there is nothing in the morphological condition of these bones which would forbid the assumption that the lesion might have been induced by the atypical form of syphilitic inflammation, they present, nevertheless, no morphological evidence to justify such a belief."

In the limits of this paper the effort has been made to restrict the discussion to the main point at issue. What other diseases may be represented in these morbid changes, in no way related to syphilis, is a question for the general surgeon, the pathologist, and the practitioner. Whether the septic forms of myelitis and periostitis with their consequent involvement of the bone tissue proper, may here be recognized as due to the influence of the staphylococcus pyogenes albus and aureus; whether tuberculosis, or the exceedingly rare inflammations of bone due to rheumatism, may be here assigned some place; or, what is in this connection of more consequence, whether a special disease of the bones, not syphilitic in character, prevailed among the aborigines, as it is said to prevail to-day among the native tribes of some regions of this country, there is not here space to inquire.

Admitting that among the bones exhumed in the Northern part of the American continent, and found in the various collections of this country, there are some which actually exhibit unmistakable lesions of syphilis, the last problem prescribed for solution is: Are any of these bones not merely syphilitic but unquestionably prehistoric? Are they parts of

"Although there is no doubt that a certain amount of alteration in the external appearance of these bones has been produced by weathering or disintegration, yet the examination of their surfaces, even with a low magnifying power, shows most conclusively that they have been remarkably well preserved. The delicate sharp-edged openings through which the new-formed bloodvessels from the inflamed periosteum entered the bone; the sharp-cut grooves along the surfaces in which the superficial bloodvessels lay as the new-formed bone spiculæ and lamellæ were built up about them, as well as the still finely preserved delicate projecting osteophytic masses, all show that to the vital processes of disease and not to disintegration or weathering are these various superficial changes due.

"If, then, we sum up the various departures from the normal which these bones present, in the form of an *anatomical diagnosis*, we find that they prove the existence of *chronic rarefying and formative osteitis, with osteomyelitis and chronic formative periostitis*.

"REMARKS ON MORPHOLOGICAL CHARACTERS AND CAUSATION.—It is evident that these are the bones of an adult who for a long time had been the victim of an extensive chronic bone disease in both legs, with a probable involvement of the left knee. This disease was so extensive and prolonged that it had led to the nearly complete making over of the shafts of both tibiæ.

"Under the influence of the inflammatory process the old bone was bit by bit absorbed, new bone being in greater or less degree formed near by to take its place. The new-formed bone, however, as is usually the case in chronic formative osteitis, has been only here and there developed in the proper amounts, situations, and relationships, so that it furnishes but a poor makeshift for and imitation of the original structure. Thus, while the right tibia, although the seat of profound disease, has fairly maintained its shape and functions, the left, although about twice as large as it should be, is a mere shell-covered spongy cylinder, which, yielding to the weight of the individual, has been bowed strongly forward.

"It seems probable that the disease was in progress at the time of the individual's death, because the evidences of repair are only such as are apt to go hand-in-hand with the destructive process in the chronic bone disease of this kind, as we know it to-day.

"Morphologically, the character and extent of the lesion in these bones is perfectly evident. When, however, we come to consider the probable cause of these extensive changes, the difficulties in arriving at a definite conclusion are very great. Whether the alterations are due to a specific cause—that is, to syphilitic infection, or to some other agency, it is, I think, not possible to say with even a measurable degree of positiveness. There is no evidence whatsoever in these bones that there has been either

our soil. Of the glass beads, the tools and ornaments of copper, and other articles found in them suggestive of contemporaneous interment with the human bodies, many were manufactured by the whites and furnished to the Indians in the way of barter for peltries. It is also of importance to note that even within the mounds which are unquestionably of prehistoric structure and which undoubtedly at the first contained only the bones of a prehistoric race, there have been repeated intrusions, and these intrusive interments have resulted in depositing in such mounds, not merely bones of later generations surviving the Columbian advent, but, indeed, large bundles of such bones, some of them apparently collected from the most miscellaneous sources.

The wide door to confusion opened by the complete recognition of facts of this character cannot be ignored. It furnishes a possibility for errors which it would be difficult to number and impossible to overestimate.

In order to demonstrate in the case of bones obtained from any mound or burial-place of the cave-dwellers in North America, some of which exhibit evidences of syphilitic lesions of a suggestive or even unmistakable character, that the latter are proofs of a pre-Columbian prevalence of the disease, it is absolutely necessary to prove beyond question; first, that such mound or burial-place was prehistoric in construction; second, that such contained bones were interred at a prehistoric period; third, and lastly, that after such burial there had been neither intrusive interment of bones nor other disturbance of mortuary relics after their first deposit.

From what precedes it is not difficult to conclude that positive proof of the prevalence of syphilis among the prehistoric races of America, based upon osseous changes, is scarcely yet at hand. With every passing year it may be remarked, the chances of securing such unequivocal demonstration are diminishing. As yet, we cannot say of any bone in our collections, that the demonstration both of its syphilitic character and prehistoric existence is without a flaw. We must, however, do full justice to the fact that an incredible amount of labor and of a praiseworthy American scholarship render it exceedingly probable to the mind of the unprejudiced that syphilis existed among the natives of the crowded West India Islands before the first visit of the whites. Even if some of the latter had been affected with a mild form of the malady, such as is described in the writings of the medical men of Europe before the fifteenth century, we can readily understand that the enormous culture-field offered by a race either virgin of that disorder or suffering from it in a mitigated form, might have been the effective origin of such a virulent epidemic as that which spread over Europe soon after the French invasion of Italy.

the skeletons of North American Indians or of the whites mingled with the latter in the confusion resulting from race admixture in war, captivity, and many common enterprises? Are they, in point of fact, the bones of individuals dead before the first of the Spaniards set foot on the soil of San Salvador—or, in other words, of those dead before the year 1496? When we turn to the archæologists for a response, we are at once impressed with the fact that the romance once attaching to the prehistoric races of America has been dissipated by the researches of science. The conjecture that a people once dwelt on this soil of some pretension to civilization, building temples and cities comparable to those found in what we call the older world, has been removed by a more rigid study of the relics of the dust. The artificial mounds and stone dwellings, numbering thousands, some of very small and some of imposing size, and scattered throughout the country, were once thought to be the work of an ancient race of people commonly called the "Mound-builders" and the "Cliff-dwellers," who were cited as a people showing evidence of an ancient civilization of no mean order and no common condition of culture. The bones which have been found in many of these mounds and in other places of sepulture, with the so-called works of art which these tombs contain, have been regarded as the remains of these primitive peoples.

These views have within a decade been shown to have a broader basis in the imagination than in tangible fact. From about the middle part of the Pleistocene period to the epoch of the first advent of the whites to the American coast, the history of man in America is seen to be the history of his slow and feeble evolution from a lower to a higher advancement in the Stone age. The best product of this process of evolution was reached by the North American Indian when he first looked seaward upon the sails of the Spanish fleet. There had been nothing superior to him before; and it is a question whether anything better has been since produced by this process of evolution from his race. He built no cities; he carved no vases; his work in metals was of the crudest sort. He and his fathers, his inferiors in culture, builded these mounds for sepulture and other purposes, sometimes as the foundation for communal dwellings. In some portions of the southwestern parts of the country where there is little vegetation and the plains are arid, he and his fathers excavated lodgings in the cliffs that hemmed in the canyons, or constructed them of the loose rocks that were easily separated from the walls of stone on either hand. But all the mounds are not prehistoric; and the same may be said of the excavated cliff dwellings. Even of the prehistoric mounds, some have been occupied in our own day, and some have been used for the interment of bones of individuals dead long after the admixture of the white and red races upon

Unfortunately, the above assertion in regard to the mixtures of nitrogen monoxide and oxygen requires considerable modification before it can be experimentally and clinically verified. If, however, there has been some advance toward finding the ideal anæsthetic referred to, this advance has been achieved by means of experiments conducted with such mixtures.

The use of pure nitrogen monoxide, so serviceable and efficient in dental practice as an anæsthetic, is not entirely so in surgery, even for minor operative procedures. It is true, for such operations as are of the very shortest possible duration, such as the incision into an abscess, it is a very valuable aid to their satisfactory performance, and one which we can ill afford to do without, whenever we have so great a number of such operations to perform that the question as to the amount of time spent on each one becomes an important one—as is the case in our public dispensaries.

But the short space of time during which complete anæsthesia, with loss of all reflexes, can be maintained by the administration of pure nitrogen monoxide interferes with the proper circumspect performance of the majority of operations generally classed together as minor operations (which we are called upon to perform in our clinics and dispensaries), especially when we make extensive use of the antiseptic method.

The opening and drainage, with incidental irrigation, of a palmar abscess, the cleansing and suture of an incised wound, the treatment of an abscess of the mammary gland, or of an acute suppurative lymphadenitis of the neck, cannot be satisfactorily conducted with the administration of pure nitrogen monoxide. I have myself used this anæsthetic in some 400 cases of the kind above described, and have always been oppressed by the sense of having to use undue haste in the performance of these small procedures.

But when such minor operations as the extirpation of ingrowing toenails, or the removal of cystic tumors of the scalp were to be performed, the administration of nitrogen monoxide in its pure form proved totally unsatisfactory and could not in any way compete with the use of cocaine.

Pure nitrogen monoxide, if given continuously, will produce complete anæsthesia with unconsciousness, on the average, in two minutes and eight seconds; and total cessation of respiration in about three minutes, on the average, which means death by asphyxia unless oxygen is speedily supplied. It is the deep cyanosis of the skin, and the dark-blue color of the blood flowing from the wound that induces the surgeon to abandon the anæsthetic before death ensues, and this, together with the fact that the heart continues to beat after respiration has ceased, constitutes the comparative safety of this anæsthetic—a safety which, however, exists only at the expense of the oftentimes unsatisfactory completion

The appended titles are those of a few only of the works and papers that might be cited in this connection :

Brühl, Gustavus : "On the Pre-Columbian Existence of Syphilis in America," Cincinnati Lancet-Clinic, May 29, 1880.

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Fournier, A. : "Syphilis Héréditaire Tardive," Paris, 1886.

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Langdon, F. W. : "The Madisonville Prehistoric Cemetery" [Author's edition], Journal of Cincinnati Society of Natural History, October, 1881.

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NITROGEN MONOXIDE AND OXYGEN FOR ANÆSTHESIA IN MINOR SURGICAL OPERATIONS.

WITH A REPORT OF FIFTY CASES.¹

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POLYCLINIC.

In some physiological text-books we are told that mixtures of nitrous oxide and oxygen gas may be inhaled with impunity for any length of time, and when thus inhaled produce anæsthesia without unconsciousness. If this were true we would have in such mixtures the ideal anæsthetic that has for so long a time been the dream of many surgeons. A perfectly safe anæsthetic, respirable for hours by the patient, which would never fail to produce complete anæsthesia during any operation, and yet not render the patient unconscious, would be hailed as an advance in surgery.

In a recent paper read before the International Congress at Berlin, Horatio C. Wood spoke of such a "perfect anæsthetic," but added : "If such a drug exists (which has the power of paralyzing the sensory nerve-trunks without affecting other functions of the body) it yet awaits the coming of its discoverer."

¹ Read before the New York Surgical Society, with a demonstration on a patient of the method employed, Dec. 10, 1890.

practice it is evident that nitrogen monoxide in its pure state may never aspire to that position of usefulness occupied by ether and chloroform.

In the first place the danger attendant upon its administration for a longer period of time than three minutes, on the average, renders its use unsatisfactory.

Secondly, the action on the pulse at the commencement of the anæsthesia, and the increased blood-pressure, are serious drawbacks and a positive contra-indication to its use in a number of cases.

If anæsthesia, once induced with pure nitrogen monoxide, is to be maintained for any considerable length of time, this can be only achieved by admitting air in greater or smaller quantities into the lungs of the patient, by which means the occurrence of complete asphyxia may be repeatedly postponed.

This method has been in extensive use for some time. The administrator watches the skin of the patient, and when cyanosis becomes so deep that a further increase of the asphyxia appears alarming, sufficient air is admitted to postpone, for a time, the complete arrest of respiration. Or a certain quantity of air may be admitted, intentionally or unintentionally, along with the nitrogen monoxide from the first. It depends upon the skill of the administrator to keep the patient between the two evils of complete cessation of respiration and the awakening to consciousness with the return of the reflex motions and struggling.

With great skill and experience on the part of the operator, however, a prolonged narcosis can be maintained, presenting much the same effect as chloroform anæsthesia, and there are in the literature a number of such cases where anæsthesia was maintained for an hour and more.

But in all these cases cyanosis was continued and pronounced, and the blood that flowed from the wound was of very dark color.

When we consider that this cyanosis is actually due to the want of oxygen, and that we have to deal with a condition of incomplete asphyxia continued for a long period of time, it appears questionable whether its effects may not result from this practice. There is a state of asphyxia of the tissues, which leads to inflammatory changes with subsequent degeneration.

An Esmarch bandage applied to the limb of an animal will, by shutting off the oxygen supply of the blood, produce such great molecular changes in the muscles (disappearance of the nuclei and inflammatory conditions) that they can be seen and studied with the microscope, as Leser has shown. And this occurs after three hours' application of the bandage. It is, therefore, not out of place to question whether such tissue-asphyxia may not be induced quite as readily by prolonged narcosis by mixtures of nitrogen monoxide and air.

Another point may here be mentioned. When only a little air is admitted along with the nitrogen monoxide, as soon as this air has

of the operation. The clonic spasms which occur before death are also liable to displace the mask and thus admit air into the lungs.

Although in many cases death may not occur so soon, in others it has occurred as early as after two minutes' inhalation of nitrogen monoxide. I recall only two cases where, before even the incision of an abscess could be accomplished, a state of asphyxia had obtained which was the cause, for some moments, of considerable anxiety on the part of the surgeon before the patients finally recovered. Both cases occurred in children, who generally take nitrogen monoxide very well.¹

The physiological action of the nitrogen monoxide is now generally admitted to consist in shutting off oxygen from the blood. This action is not to be confounded with simple asphyxia after mechanical occlusion of the air-passages; because in this latter case there is carbon dioxide present in the blood, which acts as a poison.

In asphyxia occurring after administration of pure nitrogen monoxide, there is simply a lack of oxygen in the tissues.

It is true, Ulbrich asserted that spectroscopic analysis of blood saturated with nitrogen monoxide showed no hæmoglobin to be present. But latterly Rothmann, by using more diluted solutions of such blood, established the presence of the hæmoglobin spectrum unimpaired, so that it must be conceded that there is no chemical action of the nitrogen monoxide upon the blood other than the simple shutting off of oxygen.

If, therefore, there is any interference with bodily functions in consequence of the inhalation of pure nitrogen monoxide, this may be due either to the specific action of the nitrogen monoxide (which is probably the cause of anæsthesia, as the experiments done with mixtures show), or it may be due to the absence of oxygen; and this latter condition is probably the cause of the changes in the pulse and respiration, in the blood-pressure, and of the clonic spasms and tonic muscular contractions, observed after inhalation of nitrogen monoxide.

The action of the gas on the pulse and respiration has been described in a paper recently read before the National Academy of Medicine by Wood and Cerna, who found the pulse-rate decidedly slowed, while the arterial wave was enormously increased in size (due to stimulation of the inhibitory cardiac apparatus). The blood-pressure is extraordinarily raised, sometimes only momentarily and abruptly, and at various stages during the anæsthesia; but present in the majority of cases.

The respiration very soon fails, and ceases entirely at a time when the heart is yet in full action.

When viewed as an anæsthetic to be admitted into general surgical

¹ From a verbal communication on the part of my colleague, Dr. Swinburne, I learn that he has observed four such cases, also occurring in children, in which considerable momentary apprehension was caused from an overdose of pure nitrogen monoxide, but in which perfect recovery followed.

fifth atmosphere. If this be done the result of inhalation will be anæsthesia without asphyxia.

The practical problem presenting itself for solution was how to obtain the atmospheric super-pressure. It was solved by Paul Bert by building a hermetically sealed glass cage with proper arrangements attached for increasing the atmospheric pressure. Into this cage the patient and the surgeons and assistants were all admitted, and here the gas was administered.

The practical obstacles in the way of this method are the expense of the apparatus, which alone amounted to 10,000 francs, and the difficulty of its transportation.

With this arrangement, however, success was manifest. A large number of operations were performed by L'Abbé and Péan, and the following observations were made :

With an admixture of 20 per cent. in volume of pure oxygen to the pure nitrogen monoxide, anæsthesia was almost instantly induced as soon as the patient commenced inhaling it. It could be continued for any desirable length of time. When inhalation was interrupted the patient instantly recovered. After anæsthesia no headache, no nausea, no digestive disturbance, was observed. No vomiting occurred. In short, the compound appeared perfectly safe and innocuous.

We have here an ideal anæsthetic for surgical use, but the practical difficulties in the way of its general introduction are insurmountable.

In the second year following, Raphael Blanchard published a monograph in which sixty operations of a major and minor character, some of over one hour's duration, were reported, all done after the same method of Paul Bert, and confirming his conclusions.

One year later, in 1881, Klikovitch, of St. Petersburg, began further experiments with a mixture similar to that used by Paul Bert in obstetrical practice and during parturition. He came to the conclusion that, for the purpose of rendering parturition painless, the inhalation of the mixture without additional pressure was sufficient. The patients retained their consciousness, although it was generally somewhat dulled.

The anæsthesia was not complete, however, the pain being merely diminished in some cases and not entirely removed.

The conclusions of Klikovitch were: (a) that the mixture was entirely free from danger for the mother and the child; (b) that pain was undoubtedly diminished; (c) that consciousness was not interfered with; (d) that no vomiting or intestinal disturbance was induced; (e) that no cumulative action of the gas mixture could be observed; (f) and that the mixture could be administered even without the presence of a physician; (g) but that the apparatus was not readily transportable and that the procedure was too expensive.

These observations were corroborated by Tittel, of Dresden, and by

entered into the lungs carbon dioxide appears in the blood. So that these patients present the same conditions as do patients suffering from simple mechanical asphyxia. Now, we know when patients pass from asphyxia produced by carbon dioxide poisoning to complete suffocation, they do so without muscular spasms or convulsions. We see, therefore, that although the anæsthesia with mixtures of air and nitrogen monoxide may keep the patient more quiet as to muscular reaction, it does so at no small detriment to the system. Indeed, I much question whether the sugar found in the urine after prolonged anæsthesia with nitrogen monoxide is not the expression of such detriment to the system.

Still another disadvantage may be here considered, which often attaches to these narcoses maintained by the admittance of air with the nitrogen monoxide, and that is the subjective sense of strangulation on the part of the patient. This sense is not always pronounced, however, and does not usually interfere with the performance of the operation.

In view of all these disadvantages attaching to the administration of nitrogen monoxide, either in its pure state or when mixed with air, it is not strange that many attempts should have been made to obtain all the benefits of such an agreeable and safe anæsthetic as nitrogen monoxide has the reputation of being, without its drawbacks and disadvantages.

One of the most evident methods of avoiding the danger lying in the asphyxiated condition resulting from inhalation of the nitrogen monoxide is the admixture of pure oxygen with the gas. This method has been repeatedly tried and again abandoned, so that surgeons in general had lost all hope of practically introducing it into general use.

According to Von Bruns, Hermann was the first to mix the gases, taking seventy-eight parts of nitrogen monoxide and twenty-two parts of oxygen, thus imitating our own atmosphere in the quantity of oxygen. He found that this mixture produced anæsthesia without loss of consciousness. Subsequently Von Bruns tried this mixture for surgical purposes, but was unsuccessful.

The most distinguished effort in this direction was made by Paul Bert in 1878.

His method of reasoning was simple: Pure nitrous monoxide causes anæsthesia at atmospheric pressure, but also asphyxia. The latter can be obviated by the admixture of as much oxygen as is contained in our atmosphere—*i. e.*, one volume of oxygen added to four volumes of the nitrogen monoxide. If, however, this admixture is made, the tension of the nitrogen monoxide in the mixture is not as great (by one-fifth) as it was before the admixture, and consequently no anæsthesia will be produced. In order to remedy this it is only necessary to increase the atmospheric pressure by just so much as the tension of the nitrogen monoxide gas is weakened by the addition of oxygen, namely, by one-

The other cases refer either to experiments done upon animals, or else to the use of the mixture in dental practice. Both of these categories interest us here only in so far as our knowledge of the physiological action of the mixture has been increased by them.

The most prominent among the more recent experiments upon animals published are those done by Wood and Cerna.

They found that the blood-pressure was not raised when a mixture of nitrogen monoxide and oxygen, containing 10 per cent. of the latter, was administered; but that the pulse-rate was reduced, just as in the administration of pure nitrogen monoxide. They also found, however, that such a mixture failed to produce anæsthesia.¹

As regards the length of time during which the anæsthetic may be administered, Martin, in 1888, narcotized a dog with a mixture of fifteen parts of oxygen and eighty-five parts of nitrogen monoxide, and kept the animal continually under its influence for seventy-two consecutive hours. The dog slept peacefully all the time.

When a similar mixture ($12\frac{1}{2}$ parts of oxygen and $87\frac{1}{2}$ parts of nitrogen monoxide) has been used on the human subject in dental practice for the purpose of painless extraction of teeth, it has been customary to mix the gases in a gasometer, and from these gasometers the mixtures generally escaped under slight pressure. A large number of such cases have been reported by Hewitt. In these cases, after a few inspirations, a slowing of the respiration was observed, but neither cyanosis nor stertorous breathing ever occurred. The pulse was full, strong, regular, between 80 and 90. These administrations were generally given for about two minutes; sensibility was sufficiently blunted to permit satisfactory work in extracting a tooth; muscular rigidity was sometimes present, and in some cases the anæsthetic failed completely.

In attempting to sum up the information given in all these data, and in the rest of the literature not quoted here pertaining to the mixtures, we are struck by the conflicting statements of different observers. The one statement, on which all appear agreed, is that the admixture of oxygen to the nitrogen monoxide does not cause an increase of the blood-pressure (Hillischer, 1866). The statements as to pulse and respiration vary. Asphyxia did not occur when the gases were previously mixed. But frequently the anæsthesia failed entirely, and often it was unsatisfactory; so that, with the exception of Paul Bert's cumbersome apparatus, surgical practice has as yet not profited much by these observations.

We may refer the lack of unity in the clinical observations made—to

¹ I learn from personal communication that Dr. B. F. Curtis, of this city, has lately performed similar experiments; but they have not yet been published, to my knowledge.

E. Cohn, of Berlin, and I may add that we have two further contributions to the literature regarding the use of the mixture during labor. The one by Swiecicki, who writes in favor of its use, and the other by Doederlein, who was not so favorably impressed by it. An attempted incision of an abscess of the mammary gland was a failure as far as the anæsthesia was concerned. Both used a compound consisting of 20 per cent. of oxygen and 80 per cent. of nitrogen monoxide, without atmospheric super-pressure.

The first successful major surgical operation with a less cumbersome apparatus than that of Paul Bert, appears to be one published in 1888 by Witzinger.

A mixture was administered composed of twelve volumetric parts of oxygen and eighty-eight of nitrogen monoxide and continued for eighteen minutes, during which time Von Mosetig-Moorhof performed a resection of the hip-joint. The operation had not been completed when the supply of the mixture gave out and chloroform had to be substituted. In another operative case, however, also of a major character, but occurring in dispensary practice, the compound failed entirely; while in two minor operative procedures the anæsthetic was administered with success.

In these cases the gas compound was not administered under pressure; but the percentage of oxygen was reduced from that employed by Paul Bert.

The clinical observations made during the operation of hip-joint resection were as follows: Narcosis was complete after one minute and two seconds. There was no preliminary stage of excitation. Respiration was calm; the pupils were dilated; there was total absence of muscular tonus. The conjunctival reflex was abolished. The action of the heart was regular and strong.

In the following year, 1889, Gersuny, of Vienna, published eight cases of surgical operations in which Hillischer administered a mixture of twelve parts of oxygen and eighty-eight parts of nitrogen monoxide. The gases were mixed immediately before inspiration by means of a specially arranged stopcock. In six of these cases the narcosis was maintained for from eight and a half to fourteen minutes. In two of them the duration was thirty-three and thirty-eight minutes respectively. The time necessary to induce anæsthesia varied between one and a half and ten minutes. In two cases asphyxia occurred, and the operation was interrupted. Two cases were complicated by vomiting. The pulse was full, between 120 and 140; the blood-pressure sank during narcosis. Respiration was 50, with marked cyanosis in two of the cases. No evil after-effects were noticed.

These few operations are the only surgical procedures I have been able to find recorded in the literature, where use was made of mixtures of oxygen and nitrogen monoxide.

volume of oxygen was prepared for me by the S. S. White Dental Co., of this city.¹

This new mixture was administered twelve times. Dr. Moskovich kindly volunteered to inhale it, which he did for over five minutes consecutively. He took large inspirations and breathed naturally the entire time; the pulse was regular and full, not increased in frequency. There was no cyanosis or asphyxia. He remained conscious, however, or almost completely so, all the time. His subjective sensations were hammering and ringing in the ears; he could hear a loud voice, however, and feel a slight touch. The sensation of pain was greatly diminished but not entirely removed; anæsthesia was incomplete. A slight excitation was manifest to the by-standers; he followed our movements with his eyes, which were bright.

The cases treated with this mixture are the following:

CASE I.—J. K., female, aged nineteen years; abscess of the palm. Duration of anæsthesia six and a half minutes. Anæsthesia not complete; reflex movements of the hand noticed during the incision. The patient subsequently stated that she had not felt much pain.

CASE II.—B. W., female, aged seventeen years; abscess of the hand. Was partly unconscious; did not move the hand during the incisions. She subsequently said she had felt pain.

CASE III.—B. K., female, aged eighteen years; abscess of the hand. Was unconscious in three-quarters of a minute. One incision, which was not felt, and not remembered. On awakening after two minutes a hysterical excitation was manifested, which soon passed over.

CASE IV.—M. N., male, aged forty years; stricture of urethra. Patient of extreme neurasthenic condition, highly excited and nervous at taking gas. The excitement increased under influence of the mixture. After two minutes, mixture abandoned and pure nitrogen monoxide substituted. It was found impossible to bring the patient under its influence. Wild movements of the limbs, maniacal excitation, cries. Operation postponed to future date.

CASE V.—N. M., male, aged fifteen years; complete luxation of forearm backward. The mixture administered for examination and replacement. In one and a half minutes, unconsciousness; no muscular rigidity or spasm, no reflex movements. Immediate revival on removal of inhaler. No remembrance of pain. On questioning, answered that he did not know where he had been. No after-effects.

This patient subsequently took the mixture twice more, and each time with similar excellent results. Massage and passive motion produced no sense of pain.

CASE VI.—R. K., female, aged five years; large alveolar abscess. Took mixture for three minutes. Anæsthesia complete, but patient appeared not entirely unconscious. Incision. Immediate recovery.

CASE VII.—F. S., female, aged eight years; abscesses of the hand

¹ I take pleasure in acknowledging my indebtedness to the courtesy of this firm in supplying these mixtures, since by this means I was enabled to rely upon the accuracy of measurement and the good quality of the ingredients in each case.

the variations in the methods and apparatus employed by the various administrators.

I now turn to my own experience with the mixtures of oxygen and nitrogen monoxide.

My attention was first called to these mixtures by my colleague, Dr. Moskovich, an expert in nitrous oxide anæsthesia and lecturer in the New York College of Dentistry, who told me, in June, 1889, of the experiments being made at that time in Russia.

I am indebted to the courtesy of Dr. Moskovich for administering the mixtures in all of the cases here reported, with the exception of but two.

The cases thus observed now number over fifty.

At first my efforts were directed toward verifying the facts first published by the physicians in Russia—Klikovitsch and others. Accordingly, I procured from a firm in this city a cylinder containing a mixture of twenty parts of oxygen and eighty parts of nitrogen monoxide, this being the mixture used by Paul Bert and others. The apparatus used was the same as employed for the administration of pure nitrous oxide gas; the S. S. White Inhaler No. 2 being used in connection with a seven-gallon rubber-bag reservoir. The first inhalation was taken by Dr. Moskovich himself, for a short time only, about two and a half minutes in all. After one minute he had lost sensation and consciousness; but there was no muscular relaxation. There was no trace of cyanosis, and subjectively no sensation of suffocation was experienced.

The next case was a successful one as far as the satisfactory completion of the operation was concerned: the incision and drainage of an axillary abscess, to which the patient, a young German girl, submitted without apparently feeling the least pain, although she retained consciousness all the time.

But the following three cases showed that the administration of this mixture produced excitation and incomplete anæsthesia, so that what still remained of the mixture was diluted with pure nitrogen monoxide in order to reduce the quantity of oxygen present to about half its original proportion, or to 10 per cent. With this mixture two successful operations were performed; the extraction of a foreign body in the hand of a woman twenty-four years of age, and the curetting of ulcerating tuberculous lymphatic glands of the neck in a man twenty-nine years of age. In both of these cases the patient was fully under the influence of the anæsthetic in from one to two minutes, and awoke at once at the removal of the inhaler. The anæsthetic was inhaled for four minutes without the least sign of cyanosis or asphyxia.

It was therefore believed that a mixture containing less of the oxygen would do better service; and a mixture containing 15 per cent. in

the complete anæsthetization was the failure on the part of the patient to take deep inspirations. In the case of one or two patients (who had no beards) who took deep inspirations, the anæsthesia was much improved. But the natural excitability of many of the patients about to undergo a surgical operation is apt to prevent normal and deep respiration.¹

As all these methods of administering mixtures of oxygen and nitrous monoxide gas had failed to give satisfaction, it occurred to me that by using pressure to force the gas mixture into the lungs of the patient, the amount inhaled might be increased and at the same time the tension of the nitrogen monoxide gas might be made greater.

This method is an entirely different one from that used by Paul Bert, who placed the patient in an entire atmosphere of greater tension, but did not influence the respiration in any way.

If, however, gas is administered under pressure, the mode of respiration is entirely changed. It approximates more closely to the artificial respiration which we have occasion to observe in our physiological laboratories; but with this difference, that the pressure in our case is constant, while there it is intermittent; moreover, it is not great enough to interfere with the natural expiration.

The practical question presenting itself was the construction of a proper apparatus, which should be readily portable and should permit of an exercise of pressure upon the gas reservoir that could be varied as desired.

The difficulties attending the hermetical connection between the mouth and nose of the patient and the reservoir bag were met by using the S. S. White Gas-inhaler No. 2, which in adults can be held in place so firmly by the administrator of the mixture that no air has access alongside of the mask.

In two categories of cases, however, this adaptation of the inhaler is interfered with. First, in children, for the reason that the mask is too large and admits air below the chin. If it were considered necessary to give the mixture to children under pressure, special inhalers of smaller size would have to be used. But in the case of children I have

¹ In one case the attempt was made to use morphine subcutaneously in order to counteract the nervousness evidenced by the patient. But this endeavor proved a complete failure. The patient, a man, twenty years of age, was to have a toe-nail extirpated. He was of a highly nervous organization and excitable temperament. It was found impossible to get him under the influence of the mixture, and, therefore, pure nitrogen monoxide was substituted. But this had no more effect upon the patient than the mixture. There was unconsciousness, but apparently no anæsthesia, no insensibility. At each attempt to use the knife the patient would remonstrate, and move the lower extremities. The operation was finally completed, but on recovery the patient vomited, and appeared prostrated for some time. He said he had suffered much pain, but did not know where he was.

and of the leg. Was given the mixture for six minutes. Consciousness and sensation had ceased after one minute; but slight reflex movements were noticed on incision through the skin.

CASE VIII.—L. E., male, aged three years; mastoid abscess. Unconscious after half a minute. Operation completed after three minutes. No sensation, but muscular rigidity of the extremities continued the entire time. Immediate recovery.

CASE IX.—H. W., male, aged twenty years; ingrowing toe-nail; extirpation of nail. Anæsthesia complete. On recovery, nausea and vomiting.

CASE X.—M. St., male, aged fifteen years; abscess of the jaw. The patient was apparently not fully under the influence of the anæsthetic when the incision of the abscess was commenced. Reflex movements and muscular spasm. Time of narcosis two minutes and two seconds. On recovery the patient stated he had not felt anything at all.

CASE XI.—A. S., male, aged twenty years; abscess at the back of the neck. Administration for two minutes only; anæsthesia complete, but muscular spasm and rigidity were present.

On reviewing these cases it became evident that this mixture is not satisfactory for surgical work, when administered in this manner. Only two cases of the eleven were satisfactory; in the others the muscular rigidity and spasm and the incomplete loss of consciousness interfered with the operation.

I therefore next procured a quantity of gas mixture from the same firm containing ninety parts by volume of nitrogen monoxide and ten parts of oxygen. With this mixture all further narcoses were conducted, and as far as the objectionable feature of the pure nitrogen monoxide anæsthesia—the asphyxia—is concerned, it was always avoided by the use of this mixture. No case presented any symptoms of cyanosis, the patient retaining the normal color of his skin throughout.

One of the first cases in which this new mixture was used was very successful.

CASE XII.—An adult man, suffering from an abscess of the neck, took the mixture and immediately fell into a peaceful sleep. Deep, normal respiratory movements continued and no excitement or muscular rigidity was manifested. The operation was completed in three minutes. The patient rapidly awoke on removal of the mask and had no consciousness of what had been done.

In the further cases treated with this mixture, however, the patients behaved very much as with the foregoing mixtures containing fifteen parts of oxygen to the hundred.

A state of semi-consciousness, combined with more or less muscular rigidity, manifested itself and interfered with the uninterrupted performance of the operative procedures.

It was made out, however, at this time that the chief impediment to

The upper board is provided with four stout iron wire rods, about two feet long, and attached near the corners of the board after the manner of the legs of a table. These rods are unscrewed from their place for transportation. The rods pass through large holes in the corners of the lower board. The reservoir bag being placed between the two boards is thus exposed to a constant pressure amounting to five pounds and a half in the apparatus.

It will be seen that the administration of the mixture under pressure is a task requiring some skill and attention. In the first place, the mask requires to be held so firmly over the nose and mouth of the patient, that no air may enter alongside of the inflated rubber mounting. Secondly, the administrator should keep the reservoir-bag filled with the mixture during the entire time of the operation, so as not to cause any fluctuation of the tension under which the mixture is administered. At the same time he must watch the respiratory movements of the patient (as indicated by the valve in the inhaler), and the color of the patient's skin.

The first case in which the gas mixture was administered under pressure (in December, 1889), was a brilliant success.

CASE XIII.—The patient, a robust man of twenty years, suffering from a deep abscess of the finger, was given the mixture (containing 10 per cent. of oxygen), at first without pressure for three minutes. During this time he breathed naturally but retained consciousness, and could feel the prick of a pin as painful. Then moderate pressure was applied to the reservoir-bag (about two and a half pounds), and he immediately appeared to fall asleep. After one further minute there was complete atony, insensibility, absence of muscular spasm and rigidity, and absence of reflex movements. He recovered very rapidly after removal of the inhaler, and said he had felt nothing at the time of the operation.

Twenty-five further narcoses were conducted with the use of pressure-boards, and with the same mixture of ten parts of oxygen and ninety parts of nitrogen monoxide.

Many of these may be classed as brilliant successes, while others proved failures from one cause or another; and my attention was directed toward finding out, if possible, what occasioned the failures, so that they might be avoided.

I give the cases, as briefly as possible, commencing with the more successful ones.

CASE XIV.—R. S., female, aged thirty years; abscess of hand. Mixture given for fifteen seconds without pressure; then for three minutes with pressure. Patient completely anæsthetic and unconscious. Incision of abscess. Recovered rapidly.

CASE XV.—B. E., aged twenty years; two abscesses of the finger. Mixture given first for two seconds, then with pressure added for six minutes. Complete insensibility. Incision of abscesses.

found that the mixture works quite sufficiently well without additional pressure, so that I have not as yet had such an inhaler constructed. Secondly, in cases where the patient has a large beard, it is difficult to prevent the entrance of air alongside of the inhaler. For this reason the majority of cases, where the mixture was used for anæsthetizing such patients, were failures.

The amount of pressure necessary to induce anæsthesia is a question of some practical interest. According to Paul Bert's theory the tension with which the mixture is administered should bear the same proportion to the atmospheric pressure as the mixture bears to the nitrogen monoxide in the mixture. Thus, if we use a 10 per cent. mixture of oxygen and nitrogen monoxide, it will be sufficient to increase the pressure with which it is administered one-tenth of an atmosphere.¹

In practice I have not as yet had opportunity to use so great a pressure—partly owing to the delicate construction of the reservoir bag used and partly owing to the arrangement of the mica valve in the inhaler used. The great majority of administrations of the mixture were given with the use of two simple boards of white wood, about two feet square and hinged together. Between these the rubber bag containing the mixture was placed, so that the gas was forced out into the inhaler at a pressure of about three-fourths of an inch of water on an average, this corresponding to a pressure upon the bag of three pounds, and when the gas was nearly consumed the bag was again filled from the cylinder *a tergo*.

Sometimes this pressure was employed from the commencement of the anæsthesia; but more generally the pressure was not added until the patient had inhaled the mixture for a minute or less and was considered under its influence. Then the weight of the upper board was brought to bear upon the bag.

The evident objection to this method of employing pressure is the following. When the two hinged boards approach each other the pressure upon the gas in the bag is increased, and when the bag is full and the boards become more separated in consequence, the pressure is diminished. The tension with which the gas escapes into the inhaler is consequently not equable. I have, therefore, of late contrived another simple arrangement of the two boards, by which they should remain always parallel to each other and thus render the pressure more equable.

¹ To state the problem more correctly, and since the volume of a gas is inversely proportional to the pressure, we may adduce the following proportion:

$$9 \text{ vol.} : 10 \text{ vol.} :: 1 \text{ atm.} : 1.111 \text{ atm.}$$

The total pressure on the mixture should then be 1.111 atmospheres; of this 1 atmosphere will be due to the nitrogen monoxide and 0.111 atm. to the oxygen. Expressed in millimetres of quicksilver, the pressure of the nitrogen monoxide would be 760, and that of the oxygen 84.3.

of the sutures being done with perfect ease during the unconsciousness and anæsthesia of the patient.

CASE XXVII.—Another operation was the extraction of a foreign body from the external auditory meatus in an adult man, the anæsthetic being administered in the sitting posture, and giving perfect satisfaction. The patient neither moved nor manifested signs of insensibility during the operation; although on questioning afterward he stated he had felt everything.

There were also some four further cases, of which, however, the notes have been lost.

Besides these successful cases of anæsthesia by this method of administering the mixture under pressure, there are several cases in which the results were less satisfactory.

CASE XXVIII.—L. G., female, aged six years; deep abscess of the neck, probably tubercular in character. Mixture administered without pressure for twenty seconds, then with pressure for four or five minutes in all. Incision and evacuation of abscess. The patient manifested a little excitement, breathed rapidly, and showed some cyanosis. (This was the residue of gas in the cylinder.)

CASE XXIX.—Adult female; ingrowing toe-nail. Mixture administered for five minutes, during which time the operation for extirpation of the nail proceeded satisfactorily, when clonic movements of the extremities and manifestations of excitation set in. The operation was successfully concluded, and although consciousness was absent, the movements suggested the sensation of pain.

CASE XXX.—A. W., male, aged eighteen years; severe contusion of the elbow. Mixture administered at first for fifteen seconds without, then for three minutes with pressure, for the purpose of using massage and passive motion. No pain was experienced, but slight tonic spasm was manifest in the muscles of the arm during the anæsthesia.

CASE XXXI.—V. P., female, aged twenty-two years, of very excitable disposition; suppurative axillary lymphadenitis. The mixture administered for two minutes and forty seconds under pressure before operation; then for three minutes and twenty seconds, or for six minutes in all. Incision and drainage of the abscess. Loss of consciousness complete; no cyanosis; but muscular rigidity present all the time. On awakening the patient lapsed into a hysterical condition, screamed, and was much excited. Vomiting also occurred.

CASE XXXII.—L. J., female, aged twenty-four years; was present during the foregoing operation, and much excited and frightened in consequence; suppurating mastitis. Mixture administered with pressure for five minutes and ten seconds in all. Remained partly conscious; muscular rigidity marked. Substitution of pure nitrogen monoxide; but patient could not be brought entirely under its influence.

There are, furthermore, some cases in which the action of the mixture under pressure were entirely unsatisfactory.

CASE XXXIII.—Male, aged thirty years; fistula-in-ano. Mixture given first without, then with pressure; but the patient could not be got under its influence. Pure nitrogen monoxide was then substituted, but

CASE XVI.—M. M., male, aged twenty years; abscess of hand. Mixture first given without pressure for twenty seconds, then with pressure. Complete anæsthesia and unconsciousness.

CASE XVII.—M. S., male, aged seven years; foreign body under skin. Mixture given for twenty seconds without, then for one minute with pressure. Extraction of the body. Unconsciousness and anæsthesia complete.

CASE XVIII.—N. S., male, aged thirty years; foreign body under nail. Mixture first given for fifteen seconds, then with pressure. Extraction of body. Anæsthesia and unconsciousness complete.

CASE XIX.—M. C., female, aged twenty-five years; suppurative mastitis. Mixture administered without pressure for twenty seconds, then with pressure. Unconsciousness and anæsthesia well marked, but slight muscular rigidity in the extremities. Four incisions into the gland. On recovery from the anæsthetic the patient had a laughing spell, and was greatly delighted at the fact of the operation being completed.

CASE XX.—The same patient was subsequently treated for other abscesses of the mammary gland, three incisions being made at this time. The anæsthetic was administered in the same way with the same good effect; but on recovery the patient wept and felt pain.

CASE XXI.—L. S., female, aged nineteen years, in the eighth month of gestation; abscess of the hand. Mixture administered for one minute without, then for five minutes with pressure. Two incisions were made. Unconsciousness and anæsthesia well marked; but a little muscular rigidity was noticed.

CASE XXII.—A. B., female, aged (?); suppurative lymphadenitis of neck. Mixture given for thirty seconds without pressure, then for ten minutes with pressure. Incision of abscesses.

CASE XXIII.—M. G., male, aged eleven years; foreign body in gluteal region. Mixture given with pressure. Extraction of two large splinters of wood.

In both of these latter cases some slight cyanosis was observed, the supply of gas in the cylinder being nearly exhausted.

CASE XXIV.—M. N., female, aged twenty years; tubercular lymphadenitis of neck. Mixture given first without, then with pressure. The patient lapsed into a peaceful sleep; unconsciousness and anæsthesia perfect; no reflex movements or muscular rigidity. Incision.

CASE XXV.—L. H., male, aged sixteen years; incised wound of wrist. Mixture administered with pressure from the first. Anæsthesia induced in one-quarter of a minute; kept up for three minutes. Complete unconsciousness and insensibility to pain. Anæsthesia resembling a perfectly calm sleep. No cyanosis; no muscular rigidity. Disinfection and suture of the wound. Quick recovery on removal of inhaler.

There were two or three other cases, not recorded in my notes, which may be mentioned here, where the mixture was exhibited in cases operated upon by my colleague, Dr. Schapring.

CASE XXVI.—This one was an operation for the occlusion of a lachrymal fistula in a girl aged about six years. The anæsthesia proved perfectly satisfactory, the excision of the fistulous tract and the placing

beard. This interferes with the close fitting of the inhaler to the face, and consequently air is admitted into the lungs along with the mixture. The patient cannot, therefore, be considered to breathe the mixture as it is prepared, and the desired effect is lost.

Perhaps it may be possible, by moistening the beard with water or in some other manner, to exclude atmospheric air in these cases.

A last group is represented by a number of persons, upon whom the mixture as well as the pure nitrogen monoxide has no sedative effect at all, or at any time, quite independently of their momentary mental condition. Every practitioner or dentist who has had occasion to use nitrogen monoxide in a large number of cases, has met with patients who cannot be brought under the influence of the gas at all. Generally they become more and more excited as the gas is inhaled by them, and acute maniacal attacks are sometimes observed, during which they utter howls and shrieks and make violent muscular exertions—oftentimes of an aggressive nature, and increased by restraint. Such conditions are comparatively rare, occurring in my own experience in about two per cent. of the cases, and always pass over rapidly without any detriment.

I ascribe the cause of failure in this group to habit. For I believe this condition stands in some relation to chronic alcoholism; and judging by the difficulty we experience in bringing patients used to drinking large quantities of alcohol under the influence of chloroform and ether, I suspect a similar cause in these cases.

We therefore find the field for the administration of mixtures of nitrogen monoxide and oxygen considerably narrowed down, and are obliged to rule out, as unsuitable, quite an appreciable percentage of all the cases we may be called upon to treat.

In the majority of cases, however, in young, healthy individuals and in females, the anæsthetic mixture when administered under pressure was found to work well and to be much superior to the pure nitrogen monoxide for surgical purposes. It induces a state resembling a quiet deep sleep, in which the respiration is slow and regular, the pulse regular and full and not much, if ever, increased in frequency. The blood-pressure is not increased; and insensibility to pain and unconsciousness go hand-in-hand.

It was my fortune to meet with a class of patients, as far as the foregoing observations are concerned, who were not sufficiently intelligent to observe their own feelings with any accuracy, or to inspire the confidence of others in their statements. It is one of the characteristic features of the nitrogen monoxide that while it induces unconsciousness to the surroundings it does not interfere with the activity of the memory and imagination.

The mixtures cause the patients under their influence to sleep, but also to dream, and more or less vividly—and some, on awakening are

with no better result, and asphyxia occurring with convulsions, the operation was abandoned.

CASE XXXIV.—B. S., male, aged thirty-one years; abscess of the hand. Mixture given under pressure. Incision of abscess. On removal of the inhaler a brief period of excitation of a maniacal character ensued, during which the patient uttered loud cries, walked across the room, and seated himself in a chair. On questioning, he afterward stated he had felt much pain. This patient was of a highly nervous temperament, but very muscular and robust.

CASE XXXV.—Adult man, with large growth of beard; fistula-in-ano. Mixture given under pressure but failed in its effect. Pure nitrogen monoxide substituted; but even with this the patient could not be anæsthetized. Great muscular spasm supervened and the operation, consisting in actual cauterization of the fissure and removal of hæmorrhoidal cicatricial excrescences, could be completed only with difficulty.

CASE XXXVI.—In still another case, that of an Italian, aged eighteen years, the mixture as well as the nitrogen monoxide failed to have the desired anæsthetic effect, but no mention is made in my notes as to the cause of the failure.

In reviewing all these cases where the mixture of oxygen and nitrogen monoxide was given under pressure, we must first consider those cases in which the anæsthetic failed to act satisfactorily.

These cases may be arranged in four groups or categories.

The first group comprises those patients who manifest extreme nervousness and excitability of temperament before they are given the mixture. There appears to be some element in the mental condition of these patients which counteracts the sedative influence of the mixture.

We know that certain medicines act differently upon persons of different temperament and idiosyncrasies; and that pain is largely dependent for its subjective appreciation on the attention. So, in order that a mixture of oxygen and nitrogen monoxide should induce perfect anæsthesia, the patient should be at his ease and not in an excited or frightened state of mind.

In the case of a woman, who had taken the mixture with good anæsthetic effect a day or two before, the administration of the same mixture utterly failed, because she had been frightened by the screams of another woman while under an anæsthetic during an operation preceding hers.

Closely allied to this first group of patients is a second, comprising those patients that look forward to an operation about the genital organs or the rectum. I know not why it is that this class of patients should be more difficult to anæsthetize than others. I have often observed, however, that such patients take ether and chloroform far worse than patients expecting operations on other parts of their bodies; and I believe the fact that operations upon the rectum or the genital organs are more dreaded than those on other parts will explain the matter.

A third group comprises those patients who have a heavy growth of

the victory over states of great nervous excitement or dread, or certain habits and idiosyncrasies.

The anæsthetic action of the mixture is attained by administering it under pressure; and its usefulness is properly limited to the sphere of minor surgery in such cases where other anæsthetics are contraindicated or not desired, or where the saving of time is of great importance.

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apt to mistake their dreams for reality. Under these conditions it is difficult to know whether, when a patient says he felt an incision, he actually has remembrance of pain felt at the time, or whether the pain still present in the wound on the rapid awakening of the patient is not mistaken for the pain of the operation. For this reason I think it advisable to continue the anæsthetic for some time after the operation is completed, especially when nerve-trunks have been severed.

This rapid recovery after administration of the mixture under pressure is not so marked as when no pressure is used; the longer time the pressure has been used, the more time is required for recovery. In any case, however, according to my own experience, the interval of time between the removal of the inhaler and the recovery of the patient is too brief to admit of the satisfactory use of the mixture, even with pressure, for the extraction of teeth. The pure nitrogen monoxide allows the dentist more time to work in, during the slower recovery of his patient out of his asphyxiated condition.

Some writers are fearful lest by keeping the mixture of oxygen and nitrogen monoxide under pressure in the steel cylinders, a higher oxidation of the nitrogen should occur, and nitrogen dioxide or other poisonous compounds be produced. As far as my experience reaches, I have seen no occasion for any apprehension, although I have given this question special clinical attention.

The contents of the cylinders procured from the company mentioned above appeared to act equally well whether they had been freshly prepared or kept on hand or stored for some time.

Some variation was observed, however, between the action of the first of the mixture escaping from the cylinder and that of the last. On opening the cylinder for the first time, the gas mixture contains more oxygen than the rest of the gas.

The first bagful is therefore not used at all, while the last two or three bagfuls of a cylinder act much the same as pure nitrogen monoxide, and should be given without pressure. The appearance of cyanosis in a patient under the influence of the mixture is a sign that the supply is giving out.

The large cylinder, holding three hundred and twenty and more gallons of gas, proved more satisfactory than the small ones, holding but forty; although they are less convenient for transportation.

In conclusion, I may say, then, that we have in the ten per cent. mixture of oxygen and nitrogen monoxide, an anæsthetic which may be administered with perfect safety and for a sufficiently long time to permit of the circumspect performance of most minor operations, but one which may be characterized as a weak anæsthetic. For although it will plunge the average adult into a state resembling peaceful slumber, in which anæsthesia and unconsciousness are well marked, it cannot gain

7. Rabbit, medium size, injected subcutaneously with pure culture of *diplococcus pneumoniae*; no result.

8. Rabbit, black and white spotted, medium size; injected in chest with five minims of empyema pus in which *diplococci pneumoniae* existed; animal died in thirty-six hours.

Autopsy.—Forty-eight hours after injection. Rigor mortis marked. Pleurisy slight; some fibrin in the left side at point where needle entered the lung. Peritonitis very marked with sero-fibrinous exudate; brownish serum in bottom peritoneal cavity. Cultures from peritoneum and pleura, pure culture *diplococcus pneumoniae*.

9. Small, active rabbit, injected with pure culture *diplococcus pneumoniae* obtained from animal 8.

Autopsy made before rigor mortis. Pleurisy marked; sero-fibrinous exudate on both sides. Pericarditis with adhesions; sero-fibrinous exudate. Spleen large. Peritonitis marked; sero-fibrinous exudate. Pure cultures of *diplococcus pneumoniae* obtained from pleura, pericardium and blood.

10. Rabbit, medium-sized animal, injected with peritoneal fluid of animal 9; died in two days.

Autopsy.—Four hours post-mortem. Pleurisy left sero-fibrinous. Pericarditis slight. Peritonitis marked. Spleen enlarged. Cultures show *diplococcus pneumoniae*.

11. Rabbit, large white doe, injected with twenty minims of peritoneal fluid of rabbit 10, in each lung ten minims; killed by medulla on seventh day in dying condition.

Autopsy.—Marked sero-fibrinous pleurisy on both sides and also pericarditis. Spleen large.

12. Rabbit, small-sized, lively animal; injected with peritoneal fluid of rabbit 8; first two days considerable dyspnoea, but recovered and was apparently well. Killed after a week; the only thing found were a few delicate adhesions between the coils of intestine; some clear fluid in bottom of peritoneal cavity.

13. Rabbit, medium-sized; pure culture injection; killed after fifth day.

Autopsy showed marked sero-fibrinous pleurisy; marked sero-fibrinous pericarditis, also advanced peritonitis, with sero-fibrinous exudate. Large spleen. Pure culture of *diplococci* obtained from blood, pleuritic and pericardial fluid.

14. Rabbit; died with a paralysis of posterior extremities; exhaustion; remains of an old pleurisy found; adhesions of the costal and pulmonary pleurae. This animal was injected in the pleura with pure culture *streptococcus pyogenes*.

15. Rabbit; injected with pure culture *streptococcus pyogenes* in pleural cavity from Case XI.; died after two days.

Autopsy.—Kidneys larger than normal and congested, but the spleen was enormous in size. Cultures of blood gave *streptococci*.

16. Rabbit; subcutaneous injection *streptococcus pyogenes* (pure); death after three days.

Autopsy.—Jaundice, universal, of all tissues. Lungs contained small abscess in lower right lobe. Heart, normal. Liver, very small abscesses, studded throughout. Kidneys, cloudy swelling. Spleen much enlarged. Urine, bile pigment.

THE ETIOLOGY OF EMPYEMA IN CHILDREN:

AN EXPERIMENTAL AND CLINICAL STUDY.

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(Concluded from p 50.)

EXPERIMENTS UPON ANIMALS.

Rabbits, diplococcus pneumoniae.

1. Medium-sized, white rabbit, injected in pleural cavity, with a pure culture in bouillon of the diplococcus pneumoniae; died in eighteen hours.

Autopsy.—Rigor mortis marked; chest on both sides showed pleurisy of a sero-fibrinous character; fibrin of a greenish-yellow tint; serum more abundant in left chest. Pericardium: pericarditis, with slight amount of fibrin. Peritoneum: a slightly increased serum; no fibrin; no evidence of inflammation. Blood gave upon culture and stain diplococcus pneumoniae (pure). Pleuritic fluid, diplococcus pneumoniae pure culture.

2. Black rabbit (small). Inoculated March 17th; killed by medulla while dying, March 21st. Injected pure culture diplococcus pneumoniae in chest.

Autopsy.—Sero-fibrinous pleurisy, double sero-fibrinous pericarditis. Peritonitis, sero-fibrinous exudate. Spleen large and swollen. Blood and pericardial fluid pure culture diplococcus pneumoniae.

3. Small white rabbit; injected about ten minims bouillon culture in chest of diplococcus, March 18th.

Autopsy, March 22.—Beginning rigor mortis. Slight pleuritis; very little serum and fibrin in pleuritic cavity. Sero-fibrinous exudate in peritoneal cavity (peritonitis). Spleen not very large. Blood gave pure culture diplococcus in agar and bouillon, no growth in gelatin, and found also by stain. Lung juice crude cover-glass gave exquisite capsule diplococci.

4. Rabbit, medium sized, injected with pure bouillon culture diplococcus pneumoniae; died instantly; failure of injection.

5. Rabbit, medium sized; injected in chest same as 4; died on the fourth day.

Autopsy.—Pleuritis double sero-fibrinous; very severe. Pericarditis sero-fibrinous, pericarditis marked. Spleen large and soft. No peritonitis; no meningitis. Specimens of blood, pleuritic and pericardial fluid inoculated on agar, gelatin, bouillon, etc.; reaction by stain and culture of diplococcus pneumoniae.

6. Rabbit, medium size, injected in chest with pure culture of diplococcus pneumoniae; died in six days.

Autopsy.—Double sero-fibrinous pleurisy. Pericarditis sero-fibrinous. Peritonitis sero-fibrinous. Spleen large. Cultures made from blood and pericardial fluid; diplococcus pneumoniae.

was very marked and present during the entire illness; there was loss of flesh and strength, and increasing pallor.

Admission to hospital showed a weakly child, badly nourished, pale; temperature 100°; respirations 40; pulse 120. Physical signs of fluid in right side chest. Tenth rib excised; about a pint of thick, green, tenacious pus evacuated.

Bacterioscopic result of examination, pus; diplococcus pneumoniæ (Fränkel and Weichselbaum).

May 11. Discharged cured.

CASE IV.—I. S., male, aged eleven months; has been sick for three weeks with fever, cough, dyspnoea, emaciation. Signs of fluid in right pleural cavity. Dulness to flatness. Loss of movement. Loss of fremitus. Loss of voice; pleuritic râles over whole side; syringeful yellow, thick pus removed.

Bacterioscopic examination. Staphylococcus pyogenes aureus. Result unknown.

CASE V.—P. M., male, aged two and a half years; March 3, 1890. Previous history negative. Present illness began a month ago with fever, cough, difficulty in breathing, and constitutional disturbances; fever continued marked during the first two weeks, then abated, but continued nevertheless; pallor, loss of flesh and strength, and generally becoming worse.

Admission to hospital. Anæmic, poorly nourished, anorexia, cough, prostration, and fever; temperature 101°; respirations 46; pulse 104. Signs of fluid in the left side and areas of consolidation (broncho-pneumonia) over the right side. Heart apex just inside the middle line.

March 4. Turbid flocculent serum removed from the chest. Cultures show diplococcus pneumoniæ. Aspiration, only four fluidounces (serous) removed in all, but patient continued to grow worse; temperature varying from 101° to 104°; respirations from 50 to 70; pulse 148 to 160.

16th. Needle in left side withdrew a creamy pus.

18th. Resection of rib, and about one ounce of pus evacuated, but patient grew worse; died March 27th from broncho-pneumonia on both sides.

Examination (bacterioscopic) of pus withdrawn March 16th, showed diplococcus pneumoniæ.

CASE VI.—I. K., male, aged three and a half years; March 13, 1890. Family and personal history not lucid. Present illness began nine weeks ago with fever and cough and difficulty in breathing; prostration, loss of appetite; patient complained of pain in the left side; loss of flesh and strength; there were night-sweats; patient has steadily lost ground.

Admission to hospital. Poorly nourished, anæmic, delicately built lad; no sign of rhachitis; temperature 101°; respirations 40; pulse 132 (dyspnoea). Physical signs showed fluid in left side. Heart apex pushed to the right, and sounds most intense behind lower end of sternum; no signs of phthisis at apices.

March 16. Operated resection of eighth rib; greenish odorless pus, with large masses of fibrin evacuated, as big as a child's hand.

28th. Discharged cured.

Bacterioscopic examination of pus, diplococcus pneumoniæ.

CASE VII.—M. B., aged two years; male; March 1, 1890. Family and personal history negative. The previous history is indefinite; the patient for some time has suffered from cough. Present illness dates a

17. Rabbit; injected with pure culture streptococcus pyogenes, with no result; lived for months.

In addition to the above experiments, there were some injections into guinea-pigs of the diplococcus pneumoniae; these resulted negatively, except one animal which had been injected with pleuritic fluid from a rabbit that had died in its turn from an injection of diplococcus. In this there were typical pleurisy, pericarditis, and peritonitis, with large spleen.

A few injections upon rats and mice subcutaneously resulted in case of diplococcus positively in one case. Injections into additional rabbits with pus obtained from a tubercular case gave nothing worthy of note.

CASES.

CASE I.—Y. S., aged seven years, admitted into hospital. Mother has had phthisis; child has had measles, four years ago, since then a slight cough. Became sick suddenly two weeks ago; has been ill since with cough, pain in the side, chilly sensations, dyspnoea.

Physical signs (left side). Flatness from mid-scapula down. Bronchial voice and breathing (at middle scapula), below distant breathing. Signs of bronchitis on both sides; no signs of phthisis in front or on opposite side.

Operation eighth rib, resected in the post-axillary line; abscess was found to be higher up and encapsulated; adhesions had to be broken down in order to reach empyema. Examination of pus: crude cover and cultivation; streptococcus pyogenes. Cured.

CASE II.—R. T., male, aged eight years; January 1st. Family history negative. He had scarlet fever four years ago; a year ago had a bronchitis; a month ago also bronchitis (?). Two weeks ago had fever, temperature 104° (physician). Complained of headache; next day had pain in the left side; dyspnoea; slight cough; no expectoration; temperature 103°. During the next week the temperature did not exceed 101.5°.

Admission to hospital, showed marked œdema of skin of left side, but on incision later (at operation) no infiltration of pus was seen; signs of fluid in left side.

January 2. Operation, resection as noted; there was no infiltration of the œdematous skin with pus. In spite of resection the lung would not expand.

January 3 to February 10. Temperature 100°, 101°, to 104°; pulse 110, 112, 138, to 152; respiration 32, 44, to 52. The boy did badly; there was a profuse discharge of pus, fetid in odor at each dressing, and lung did not expand. Several resections were performed upon this chest to favor retraction of chest toward lung and closure of the large cavity in the chest. There resulted much deformity, and at discharge from hospital there existed a discharging fistula.

Bacterioscopic results were limited to stainings of cover-glass specimens of pus and showed tubercle bacilli. Animal experiments negative.

CASE III.—I. S., aged two years; male; February 18, 1890. Has had measles, a year ago; inflammation (?) of the lungs ten months ago; present illness began with fever six weeks ago; this fever after a few days was complicated by convulsions recurring at intervals. Cough

Operation, exsection of rib; twenty-nine and a half ounces of pus of creamy character evacuated.

Bacterioscopic examination revealed diplococcus pneumoniae.

Result: recovery.

CASE XI.—Male child, aged four months. May 9, 1890. Had been perfectly well until two weeks ago, at this time child was vaccinated; simultaneously with the vaccination, there appeared a burrowing abscess on the dorsum of the left foot which was deep and passed between the metatarsal bones. Eight days ago a febrile movement appeared and the patient was referred by me to a surgeon for treatment. There were at this time no lung symptoms. Three days ago the child developed cough and dyspnoea.

Status præsens: There is cough, dyspnoea, sighing respiration; pulse increased in rapidity; temperature 103° ; abscess on foot still present; vaccine pustule still size of five cent piece and angry-looking. Examination of left side revealed chest full of fluid and needle withdrew pus, light yellow, thin, easily separating into two layers, clear and serous, upper and lower purulent.

May 10. Exsection of rib; six ounces of pus (milky) evacuated.

12th. Died; no autopsy.

Bacterioscopic examination of pus revealed streptococcus pyogenes.

CASE XII.—May, 1890. Male, aged twelve months; well developed; has been suffering from pertussis and just recovered; about two weeks before date was doing well, when suddenly there appeared a new cough with dyspnoea, and broncho-pneumonia of the right lung was diagnosed. The cough and fever and dyspnoea still continued up to May 9th, when fluid was found in the right side. A needle introduced about this time withdrew a clear serum; temperature 103° ; pulse 160, and rapid respiration. Transferred to the hospital, where child next day showed a measles eruption.

13th. Needle introduced into right side and pus was withdrawn; child was doing well, but on the morning of the above date, patient suddenly developed tympanites (peritonitis(?)) and died.

Bacterioscopic examination of pus of May 13th and serum of May 9th revealed diplococcus pneumoniae.

CASE XIII.—Empyema; perforation; spontaneous recovery. Female, aged thirteen months. May 12, 1890. Previous history negative. Child was taken ill about three weeks ago with cough, fever, dyspnoea. The child had dyspnoea, and moaned when it breathed; there was a frequent cough and a temperature of $103\frac{1}{2}^{\circ}$; pulse 160. Examination of chest showed consolidation of the left upper lobe (dulness, bronchial voice, and breathing). Diagnosis: broncho-pneumonia. The patient seemed to improve up to a week ago, when the temperature and cough persisted, the dulness behind became more marked and spread toward the base of the lung; fremitus absent; voice and breathing bronchial. Needle introduced and pus withdrawn from left side, greenish-yellow, adhesive; heart not displaced; operation advised.

August 1. Child had escaped from observation, and having refused operation passed under care of others. It was brought to me, August 1st, for diarrhoeal trouble; chest showed no signs of old trouble; lung had expanded; voice and breathing good, no friction sounds. There was a slight dulness only left over the affected side; fremitus good; no fever; child looks much improved. Mother says that after leaving my

week back; contracted a severe cough, and dyspnoea became very marked; fever, night-sweats, loss of appetite.

On admission, patient is well nourished; suffers great dyspnoea, this symptom so marked as to give impression that œdema of the glottis was present, or obstruction in the larynx. Intubation attempted but failed, and tracheotomy performed. Temperature 100°. Examination of the chest revealed spots of broncho-pneumonia over both sides. March 5th to 15th, temperature 101° to 105°; respiration 40 to 76; pulse 140, with dyspnoea; increasing; attempts to remove tracheal tube resulted in renewed attacks of dyspnoea. March 15th, signs of fluid in left side of chest, and on March 16th, operated, and twelve ounces of pus, greenish, no bad odor, removed from left side. Eighth rib resected.

March 18. Discharged cured.

Bacterioscopic study and culture of pus revealed diplococcus pneumoniae.

CASE VIII.—H. G., male, aged twelve years. Father, mother, and sisters and brothers in good health; previous history indefinite. It is not possible to obtain definite information as to the exact time of onset of present illness. He has for a few weeks past suffered from cough, fever, and night-sweats, pain in the right side upon coughing or taking deep inspiration; has been confined to his bed; no history of traumatism.

Admission to hospital. An anæmic but well-built lad, not at all emaciated. Physical examination revealed fluid, and needle withdrew pus in right side. Temperature 100°; respiration 40; pulse 140; resection of rib on right side and a pint of greenish fluid, not adhesive pus, removed; no fibrin clots were withdrawn; some adhesions between the costal and pulmonary pleurae.

Bacterioscopic examination of pus revealed streptococcus pyogenes.

Result: Cure.

CASE IX.—Female, aged two and one fourth years. April 10, 1890. Family history shows nothing. Present illness began three weeks ago with some eruption (?) upon the body; about a week later there appeared a cough, fever, distress in stomach and abdomen.

Admission to hospital. Anæmic child, with signs of rhachitis, cough, dyspnoea, and some cyanosis; temperature 101°; pulse 160; respirations 48. Physical signs of fluid in the right side, pus withdrawn, immediate operation, exsection; sixteen ounces of pus evacuated. April 12th to 22d, temperature varied from 99° to 103°; respirations 40 to 43; pulse 130 to 158; on April 22d, symptoms pointing to an invasion of the healthy lung by broncho-pneumonia appeared, and patient died with all the symptoms of pneumonia and exhaustion.

Bacterioscopic examination of pus revealed diplococcus pneumoniae (Fränkel and Weichselbaum).

CASE X.—M. G., male, aged four years; April 18th. Family and previous history negative. Present illness began seven weeks ago with scarlet fever; three weeks later the patient developed general anasarca, this lasted until eight days ago; at the same time he had a severe cough, chills, and fever; constant sweating, lasting until the date of admission; loss of flesh and strength, also failure of appetite and frequent micturition.

Admission to hospital. Patient anæmic and emaciated, cough and dyspnoea. Temperature 99°; respirations 42, and pulse 140. Signs of fluid in the left side. Heart apex pushed to the right of the sternum.

shows simply the presence of the staphylococcus or streptococcus alone, and where there is no history of traumatism with perforation of the skin, or where there is no suppurating focus of infection outside the pleural cavity, are most puzzling to explain because the bacterioscopic finding gives us no clue as to the origin of the disease. The staphylococcus and streptococci are microorganisms which exist in suppurating processes of the most diverse nature and situation in the body. I have four such cases to place under this heading. One female, aged seven years, and three male children, aged eighteen months, two years, and twelve years respectively. In none of these cases was there a history of traumatism of any kind. When they came under observation, they had been ill with symptoms of pulmonary trouble for periods varying from one to six weeks.

Assuming that an infection of the pleura is most apt to result from adjacent inflammatory processes, the most usual disease preceding or complicating such a pleurisy is pneumonia. Weichselbaum has demonstrated that in addition to the pneumococcus of Fränkel, there exists in the lungs of pneumonic patients the streptococcus pneumoniae (or pyogenes) and the staphylococcus pyogenes aureus. Though we cannot as yet yield to these microorganisms the dignified position of being the direct cause of pneumonia, we find that they exist in the lung constantly as so-called mixed infections, as they do in diphtheria. Thu¹ has argued that microorganisms in pneumonic fibrinous pleuritis and pericarditis (pneumococci) first find their way through the lymph channels into the subpleural tissue and then into the pulmonary pleura, and finally gain the surface of the pulmonary and costal pleura; from thence they may be carried into the mediastinal spaces and reach the tissue of the pericardium and even the muscular tissue overlying the costal pleura. It is true that the failure to find the pneumococcus in the exudate does not disprove the possibility that at some early stage of the empyema it might have been present; however the tendency to-day is to consider the active predisposing causes exposure to cold and moisture. It is thought that though the above microorganisms may exist in the air passages, as has been proven in the nose and mouth of a healthy individual, they may remain inert until, cold and wet reducing the resistant vitality of the organism, they cause an empyema; so a wound in the chest wall without perforation of the skin may exert a similar influence.

GROUP II.—The cases of empyema which fall under this group are the most interesting of all pleurisies. They are those which either complicate or follow a pneumonia. In the pleuritic exudate of such an empyema the diplococcus pneumoniae (Fränkel and Weichselbaum) may be demonstrated as in all of my cases.

¹ Centralbl. f. bakteriöl., 1889, Bd. v.

care the patient grew worse until she began to cough up large amounts of yellow matter (pus?). This continued some time at intervals; patient recovered; no cough.

Bacterioscopic examination of pus revealed diplococcus pneumoniae.

CASE XIV.—*May 13, 1890.* L. H., aged eighteen months, male; previous history negative; father and mother well and in apparent good health. Nine days ago child developed a cough, fever and dyspnoea; the dyspnoea increased, fever continued, and there was restlessness at night. When brought to me the child was anæmic; had signs of rhachitis; there was much dyspnoea and moaning respiration, drowsiness, and partial stupor. Temperature 105°; pulse 165; respirations 56. Physical signs of fluid in right side below mid-scapula, needle introduced and a clear bloody serum obtained.

14th. Needle introduced, signs of fluid having increased, and withdrew milky pus.

15th. Exsection of rib, eight ounces of pus removed.

Bacterioscopic examination showed staphylococcus pyogenes aureus.

CASE XV.—D. H., male, aged five and a half years. Father and mother living, has had no special illness; present illness dates from October 6th, when there was fever and pain and dyspnoea; the pain was referred to the stomach; there was no distinct history of chill. When first seen, October 7th, patient was a well-developed child; no signs of past rhachitis; there was dyspnoea, a dry cough, fever; there was also some restlessness; complains of stomach pain. Temperature 103°; pulse 130; respirations increased. Signs in chest negative.

October 8. Temperature 104°; pulse 140; respirations rapid; pain in right side; rusty sputum. Diagnosis at this time: right lobar pneumonia lower lobe. At end of five days signs pointed to a resolution of an ordinary lobar pneumonia; temperature 102°.

19th. Signs of fluid in chest. The boy has not been doing well, and new signs appeared; loss of fremitus; flatness, bulging of right side; subcrepitant râles close to the ear, voice and breathing though coarse heard over whole chest; dyspnoea great; temperature 103½°; pulse 160; respirations rapid.

21st. Operation: simple opening in chest and tube inserted; about half a pint of pus evacuated; not foetid; yellow color.

27th. Discharge foetid and penetrating odor; the drainage bad and a resection was performed, November 5th. Final complete recovery.

Bacterioscopic examination of pus first taken from chest showed diplococcus pneumoniae.

CLINICAL CLASSIFICATION.

The cases here recorded, from a clinical and bacteriological standpoint, divide themselves quite readily into groups.

GROUP I.—Here we can place those cases of empyema in which the bacterioscopic examination revealed the staphylococcus pyogenes aureus, or the streptococcus pyogenes. These microorganisms did not exist associated, but in so-called pure form and isolated in the exudate. The etiology of these cases is very difficult to make out, because this group does not include cases of empyema where an extraneous source of infection exists. Those cases of empyema in which the pleuritic exudate

This shows distinctly that though an exudate may be serous at first, it may subsequently become markedly purulent, not on account of anything introduced into the chest on the occasion of the first puncture, but from the continued action of microorganisms already present (*diplococcus pneumoniae* or *streptococcus pyogenes*, Fränkel). Again, pus from the chest has a tendency, without this cavity, to separate into strata, the upper one being serous and containing but few leucocytes; we may aspirate this stratum in a marked empyema, and thus can not draw any definite conclusion as to the nature of the exudate. If an exudate contain streptococci, even though serous, we can with certainty predict the advent of pus (Fränkel). We might make a similar assertion of fluids containing the *diplococcus pneumoniae*. If a serous fluid withdrawn from the chest fails to reveal any microorganisms upon stain or culture, we can conclude that there is a probable tubercular element in the pleurisy (Fränkel). If such a serous exudate subsequently shows the presence of microorganisms (streptococci) and then becomes purulent, we can suspect contamination. With conscientious cleansing of a needle-syringe, we may fearlessly enter the pleural cavity without having in the least compromised the health of the patient. I am certain much misunderstanding has arisen on this subject through a misinterpretation of the real nature of some of these serous exudates. While some are devoid of microorganisms (tubercular), others are filled with pyogenic microbes, capable not only of producing suppuration, but maintaining it.

GROUP III.—This group, which includes empyema of tubercular nature, is most unsatisfactory in its various aspects. Fränkel, who spent much time and patience upon tubercular pleurisy in the adult, found cases in which examination of the exudate yielded a negative result. So common was this, that he concluded that a negative finding was much in favor of the tubercular character of the exudate. These exudates may be localized or involve the whole pleura. They may or may not be accompanied by lung areas of tuberculosis; in cases where the lung is involved, in the adult, the tubercle bacilli may be found in the sputum, but in children the examination of the sputum is not always practicable. If, as in children, the lung shows no positive involvement and the examination of the exudate is negative, diagnosis and prognosis are difficult. Ehrlich (*Charité Annales*, 1888) explains the absence of tubercle bacilli in two ways: 1. The fibrin formations in the exudate remove the bacilli by enclosing them. 2. Thickening of the pleura by adhesions causes a resistance to the transmigration of bacilli. In empyema, the bacilli are more numerous than in simple pleuritic exudates, because cells passing in myriads into the exudate are more apt to carry bacilli with them. Israel and Gerhart think that the bacilli rather become entrapped in the miliary growths of the pleura, and thus do not pass into the exudate.

These were two female children, aged thirteen months and two and a quarter years respectively, and seven male children, aged twelve months, two years, two and a half years (two), three and a half years, four years, and five and a half years. They had been ill when they came under observation for periods ranging from one to nine weeks. In one case the patient had been under the observation, from the very beginning, of a skilful observer (Case XV.), and the diagnosis of lobar pneumonia followed by a pleurisy (empyema) was distinctly traced. As recorded elsewhere, the diplococcus pneumoniae (Fränkel) could be easily recognized in the crude pus by spreading upon cover-glass; beautiful capsule appearances were also obtained. Pure cultures were isolated in every case and their virulence tested upon animals while the cultures were still recent. The experiments were in the direction of intra-pleural or pulmonary injections, so that appearances in the animal experiments resembled very much what is seen in the human subject. If such a pathogenic microorganism is found in a pleuritic exudate, it can be traced to only one probable source, the lung. It is scarcely necessary in any of these cases to prove clinically the existence of a pneumonia. If one will refer to the histories of the cases he will see that in some a pneumonia, either of the lobar or lobular type, must have been in active progress when the empyema was operated upon. At least the physical signs and symptoms indicated this condition of affairs in the lungs upon the opposite side to the empyema, if not in the lung corresponding to the empyema.

In one case, where the patient succumbed, the opposite lung was undoubtedly affected. In other cases, after operation, the temperature would not only persist, but persistent broncho-pneumonic processes were present; this was notably the history of Case III., who continued in the hospital for months, being finally discharged cured. In these cases, tuberculosis was excluded by all possible methods, both clinical and bacteriological. But in the majority of the cases in which the pneumococcus was found in the pus of the empyema, the evacuation of the pus marked the abatement of all symptoms and recovery of the patient, showing that the pneumonia, if it existed, had preceded the accumulation in the chest and had passed through its various stages. The pneumococcus has been found by Weichselbaum in lungs the seat of lobular pneumonia, as well as in those the seat of lobar process.

I have elsewhere described the macroscopic characters of the pleural exudates in the cases of empyema belonging to this group. But in two the pleuritic fluid when first withdrawn from the chest was serous in character, in one case even devoid of flocculi. In both of these cases, the exudate taken later with an exploring syringe was markedly purulent, and both cases were operated upon. In the serous fluids first obtained, as also in the purulent exudate, the diplococcus was found.

and cloudy kidneys. These results differ widely from those with streptococci obtained from cases of Group I. Here the animals survived and autopsies after months showed no effects of infection, or as in rabbit 14, only the effects of local processes limited in nature.

PUTRID EMPYEMA.

By this I desire to designate those cases of empyema in which there was a putrid or fetid odor to the discharge, and in which this odor persisted.

In both of my cases the exudate turned putrid after operation. In one (XV.) the empyema followed a pneumonia, and in the fluid first withdrawn from the chest, the pneumococcus alone existed. In this case, on account of the imperfection of drainage due to the first mode of operating, there was retention of pus, the chest wound finally closed, and when reopened again for resection, the pus was very putrid.

The second case was that in which the pus showed the presence of tubercle bacilli. There was no odor to the pus upon the first resection. But there was not only lack of any expansion in the lung, leaving an immense cavity in the chest, but the pus remained in this cavity. Here the empyema became putrid, necessitating repeated washings of the chest with creolin solution. In spite of this fact, the pus remained putrid. Investigation succeeded in revealing the presence of a fluorescent green bacillus, rather thick and short, which fluidified gelatin (much like that found in water) and grew upon agar of Weichselbaum in a dark-green layer with a rather mawkish odor to the growth. This is all that could be found in addition to the tubercle bacillus and streptococcus previously present. This shows that the most innocent exudate may turn putrid, as in the case of pneumonic empyema, as well as the tubercular cases. It seems rational to suppose that lack of expansion of the lung or retention of pus, especially where the chest has been injected with so-called antiseptic solutions (in the above cases boric acid or creolin), are conditions peculiarly favorable to the development of putrid exudates. I have seen air enter daily freely into the chest cavity without causing the pus to become putrid; also the introduction of bacteria from the lips of the wound was unavoidable, on account of the free moving of drainage-tubes and dressings and tampons over the mouth of the external wound. Yet drainage being free, with full lung expansion, no putridity appeared. In the future, the appearance of a putrid exudate in a chest in which primarily the pus possessed no such characters, would make me think of retention due either to insufficient drainage or want of proper expansion of the lung.

PROGNOSIS.—We can safely say that the present status of our knowledge in these cases enables us to assure our patients with moderate certainty as to the outcome of the illness of their children. Such

I have but one case to place in this group, that of Case II., a boy of eight years, who had had several bronchitic attacks years before the advent of his empyema. The exudate had to be repeatedly examined in order to establish the presence of tubercle bacilli (stained by Ehrlich's method), but the experiments with animals were of a negative character. In this case the *streptococcus pyogenes* was also found in the exudate from the very first; this is similar to a case in the adult recorded by Fränkel. The formation of adhesions tying down the lung must have been exceedingly great, for operation found the lung unable to expand and repeated exsection of the rib had to be resorted to, in order to obtain partial closure of an immense suppurating cavity. The deformity resulting was most pronounced. I have made attempts in other children and this boy to obtain sputa for examination, but have not succeeded. I attributed my ill success in inoculation upon animals to the presence of contamination in the pus.

Thus, my group of tubercular empyema remains unsatisfactory, though diagnosticated with a certainty from the presence of tubercle bacilli in the exudate. The lungs upon examination yielded no evidences of involvement.

GROUP IV.—In this group we might class those cases of empyema in which some focus of suppuration situated in another part of the body may be with great probability pointed to as a source of infection. The infecting focus may be adjacent, as in the cases of Fränkel, where a retro-pharyngeal abscess or perforating peritonitis were the cause of the empyema, or the empyema may be one of the manifestations of a species of pyæmia (as in my own case). This was a male infant, aged four months, who was perfectly well up to within two weeks of its death. The infant was vaccinated and then developed a burrowing abscess of the foot, and after this the empyema appeared. No autopsy was allowed; it would have been interesting to see (though no pneumococcus was found in the exudate of the pleura) whether a pneumonia (pyæmic) was present with the empyema. The rapid death of the child speaks in favor of some virulent infection; an autopsy might have revealed several other hidden foci of suppuration.

The bacterioscopic finding and experiments in the above case are interesting. The *streptococcus* which was isolated and existed alone in the exudate was certainly very virulent. Two animals injected with a pure culture (15 and 16), both died. Both were injected at the same time with the same culture; the one in the pleural cavity, in this case, the animal died in two days; *streptococci* were found in the blood and organs, but there were no inflammatory exudates; the kidneys were swollen and the spleen was enormous in size. The second animal was injected subcutaneously, and the report of the autopsy shows metastatic abscesses all over the body with general jaundice and enlarged spleen

A REMARKABLE CASE OF SKIN DISEASE.

BY J. FRANK, M.D.,

ATTENDING SURGEON TO THE ST. ELIZABETH AND COOK COUNTY HOSPITALS, CHICAGO, ILLINOIS.

Reported by W. C. SANDFORD, M.D.,

HOUSE PHYSICIAN TO THE ST. ELIZABETH HOSPITAL.

THE case which we are to consider is unique, not alone in the fact that the shedding of the cuticle and nails of the hands and feet was complete, but in its repetition for thirty-three consecutive years, on the same day of the month, and within a few hours of the same time of the day.

In a research in medical literature, in which we were kindly assisted by Dr. James S. Newburgh, we failed to find a parallel case; cases have been reported where the shedding was complete, but none which recurred at regular intervals.

The patient, John H. P., of Phillipsburg, Montana, called upon Dr. J. Frank, July 22, 1890, with a letter of introduction. Dr. Frank referred him to the St. Elizabeth Hospital, where he was admitted as a private patient on July 23, 1890. While here, the patient was seen by a number of prominent dermatologists of this city, and was studied with special interest by Drs. James Nevius Hyde, McArthur, J. S. Newburgh, and F. H. Montgomery.

The patient, a miner by occupation, has been exposed to all the hardships of camp life, but has borne them with ease, being well formed, and apparently in perfect health. Height 5 feet 9½ inches, weight 150 pounds, eyes dark, hair dark-brown, full set of natural teeth, special senses all normal, intelligence good, skin perfectly normal. No birth-marks were to be found.

His history, as given by himself, is briefly as follows: Father and mother both living; father sixty-eight years, mother sixty-one years. Maternal grandmother living, and in her ninety-seventh year. The patient is the second of a family of thirteen children, all of whom are living and in good health. Has never had any of the eruptive fevers, and has never required the attendance of a physician. Had two light attacks of gonorrhœa, and was salivated once by the breaking of a mercury retort, but took no treatment for either.

He was born December 29, 1857, during the Kansas and Missouri trouble. His mother was driven at night from her home in Franklin to the Meredenson River, four miles distant, where she was confined in the open woods, with no attendant but her mother. Mother and child were taken to shelter the following day. As there was nothing peculiar occurred during her pregnancy or confinement, the woman cannot account for the skin shedding of her child which took place later.

On the 24th of July following his birth he was suddenly taken ill—vomited, became hot and feverish, and in a few hours the entire surface of the body was scarlet-red. Symptoms increased for three or four hours, when they gradually subsided, and the patient was supposed to have recovered; but on the fourth or fifth day following the attack the entire

prognosis may be made at the bedside or within a very short period from the first examination of a case. The simple means at the disposal of every clinician are adequate for the examination of crude specimens of pus, and delay of a day or two at the most is all that may be necessary for more deliberate investigation. Nor do I think that we should take too much credit to ourselves for the recovery of a certain class of these cases which, under proper guidance, invariably get well. Thus, it would appear that the best prognosis is held out to those which belong to Groups I. and II. More especially is this true of cases of meta-pneumonic empyema. In one of these (XIII.), in which the purulent exudate filled the chest and was withdrawn from the same by exploring needle and contained pneumococci, the patient recovered; having refused operation, the empyema perforated the lung and thus gained exit externally, pus being coughed up. Subsequent examination of this case revealed *nothing abnormal on the diseased side but slight dulness*. The lung had thoroughly expanded. Fränkel records similar cases in the adult. It would scarcely be well to expect too much from such *laissez faire* treatment, for a large percentage (Ziemssen's *Vorträge*) of cases which are allowed to perforate die. The age of the patient and the presence or absence of any considerable pneumonia will weigh in each case. Some authors are enthusiasts for the simple opening and drain in the chest; others insist on the trial of repeated aspiration; others contend that resection of the rib is the only safety of the patient and secures a rapid expansion of the lung. The truth lies in the etiology of the cases of empyema. In the meta-pneumonic exudates cases will do equally well by the various modes of treatment; in other words, the pus evacuated by whatever means, there is an inherent tendency to absorption of what inflammatory product there is remaining and return to a normal status, as in the pneumonic lung.

The pneumonic exudates, if they hold out such brilliant prospect of recovery to the patient, are a striking contrast to the tubercular cases, where only a partial recovery is at best possible. There are cases on record where, especially in children, an empyema (Ziemssen's *Vorträge*) of established tubercular nature has made an apparently good recovery, yet we must doubt its permanency. We cannot rid ourselves of the idea that a large extent of surface like the pleura, once tubercular, must, if recovery takes place, be a latent danger to the patient.¹ In other cases, the recovery results with fistulæ, retraction, and all the concomitants of permanently crippled respiratory apparatus. The pyæmic cases are fatal as far as we know.²

¹ Klesch and Vaillard (*Arch. de Physiol. et Path.*, 1886) have made autopsies upon pleurisies of a tubercular character which had apparently recovered, and were able to prove their tubercular nature at autopsy.

² I desire to express my sincere obligations to Dr. Barium Scharlau, of the Mount Sinai Hospital, for the clinical material which he so kindly placed at my disposal.

was touched. This was probably due to a hyperæsthetic condition of his skin.

4.10 P. M. Nausea, and attempt to vomit. The nausea subsides between paroxysms of vomiting, and patient converses intelligently. Right lower limb as red as trunk; left beginning to flush. Tongue and mucous membrane of mouth very red. Trembles greatly; cannot carry glass to lips. Given two glasses of warm water and a drachm of syr. ipecac.

4.15 P. M. Redness shows through the soles of his feet, giving them a yellowish-red appearance. Skin has a warm, greasy feeling. Perspires only under eyes and on forehead.

4.20 P. M. Left limb nearly as scarlet as trunk.

4.25 P. M. Vomited one pint of water and mucus.

4.30 P. M. Pulse 68; temperature 99.6° F.

4.50 P. M. All the body, excepting the forehead and beneath the eyes, scarlet-red, showing distinctly in the palms of the hands and soles of the feet.

5 P. M. Pulse 76; temperature 99.4° F. Vomited a small amount of mucus.

5.5 P. M. Nausea and acute pain. Given a glass of warm water. Trembled so he could scarcely carry glass to lips. Vomited immediately after taking water.

5.30 P. M. Pulse 76; temperature 99.3° F.

5.45 P. M. Vomited four drachms of thick gray mucus with extreme pain. Bowels moved; stool light-colored.

6 P. M. Pulse 76; temperature 99.3° F. Surface of body warm, but patient complains of being cold.

6.30 P. M. Pulse 88; temperature 101.2° F. Resting quietly. Took a light supper.

7.35 P. M. Pulse 92; temperature 101.4° F.

8.30 P. M. Pulse 92; temperature 102° F.

8.45 P. M. Given ten grains of antipyrine.

9.30 P. M. Pulse 88; temperature 103° F. Nausea and an attempt to vomit. Symptoms soon subsided. Patient rested quietly from 10 P. M. until 7 A. M. the following morning, sleeping most of the time.

10.30 P. M. Pulse 80; temperature 100° F.

11.30 P. M. Pulse 80; temperature 100° F.

25th, 12.30 A. M. Pulse 84; temperature 101.7° F. Given 10 grains of antipyrine.

2 A. M. Pulse 80; temperature 101.4° F.

5 A. M. Pulse 88; temperature 101.2° F.

7 A. M. Pulse 84; temperature 100.5° F. Still drowsy. Has a slight headache.

9 A. M. Pulse 80; temperature 99.8° F.

8 P. M. Pulse 84; temperature 101.5° F.

26th, 8 A. M. Pulse 84; temperature 99.5° F. Cuticle beginning to scale on scrotum.

8 P. M. Temperature normal. Skin has assumed its normal color. Redness faded in the same order as it appeared.

27th. The epidermis of the mucous membrane of the tongue and mouth came off. Tongue resembled a typhoid tongue after it has cleaned up.

28th. Perspires freely from forehead and under eyes. Cuticle over chest raised up in the form of blisters by the perspiration.

cuticle was cast off, and a few days later the nails of his hands and feet were also shed. This was repeated each year on the same date. His mother took no notice of it at first, thinking it was one of the eruptive fevers. When he was seven years old he was taken to a physician in Denver, who kept him under observation for a time, but gave no treatment. He has never been attended by a physician except from curiosity.

The patient first remembers the shedding in 1865, when the cuticle and nails were cast off while at play. These attacks have been repeated each year on the 24th of July, usually at 3 P.M., and never later than 9 P.M.

The paroxysm begins abruptly. Patient has a feeling of lassitude and weakness of fifteen to twenty minutes duration, followed by muscular tremors, nausea and vomiting, a rapid rise of temperature, skin and mucous membrane of tongue and mouth become red and inflamed, and are hot and dry. No perspiration appears after the paroxysm begins until the cuticle is cast off.

The acute symptoms begin to subside in from three to four hours, and are entirely gone by the end of twelve hours, with the exception of the redness of the skin which does not return to its normal color for thirty-six hours more. The patient has been delirious three times during these attacks, once for nine days.

In his early life the cuticle began to be shed on the second or third day after symptoms appeared, and was complete by the fifth day; but each succeeding year it takes a little longer, until now it is ten or twelve days before shedding is complete. The cuticle can be detached in large sheets, and he has always been able to remove it from the hands and feet in one piece in the form of gloves and moccasins.

The nails are loosened and crowded off in about four weeks after the acute stage.

On the 24th of July, the day following his admission into the hospital, the above symptoms occurred with marked similarity.

By invitation from Dr. J. Frank, a number of physicians were present during the acute stage. Among them were Drs. R. N. Hall, J. K. Bartholomew, H. M. Luken, L. A. Beard, Archibald Church, and W. F. Coleman. At 2.45 P.M. the patient was seen by Dr. Luken and myself. He was apparently well, but assured us he would soon be sick.

3 P.M. Was still walking in the hall. Very nervous, and had a peculiar, anxious expression.

3.15 P.M. Retired to his room. Nervousness increasing; slight muscular tremors; hands, wrists, and neck beginning to get red.

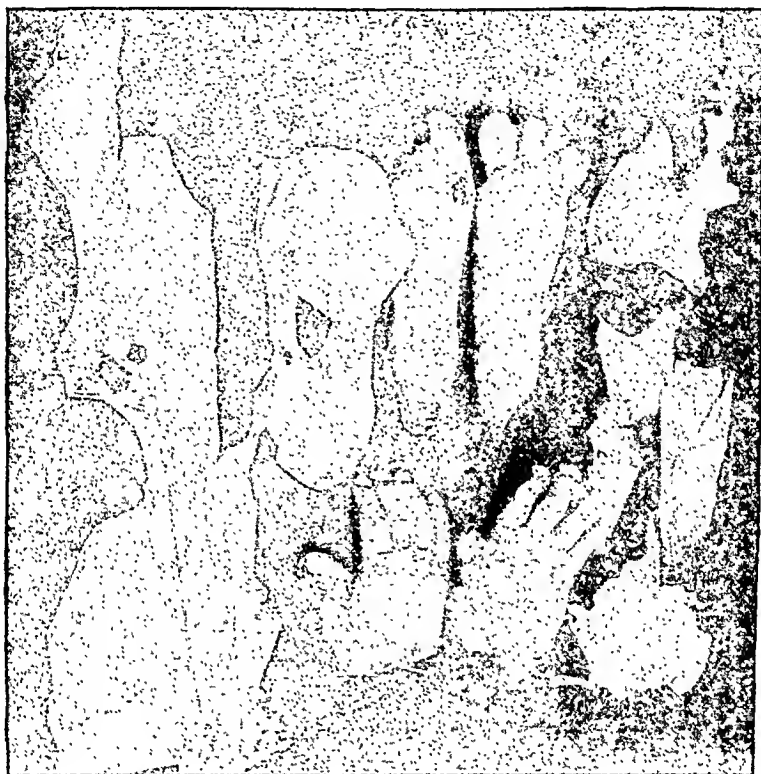
3.30 P.M. His entire trunk, and arms down to the elbows, bright scarlet-red, resembling the appearance of a scarlet-fever patient, but cuticle is not elevated.

3.50 P.M. Nausea; trembling over whole body; redness extended down to the great trochanters; mucous membrane of tongue and mouth also congested.

3.55 P.M. Vomited two drachms of thick tenacious mucous, streaked with blood. Was given a glass of warm water and a teaspoonful of syr. ipecac.

4.05 P.M. Pulse 68; temperature 97° F.; slight flush over limbs, more noticeable over left. He claimed to get an electric shock when the skin

Under date of August 29, 1890, Mr. J. P. writes the following: "I arrived at Black Pines the evening of August 22d, went to work that evening, and continued until the following evening. Am in perfect



health. Enclosed find nails from little finger and second finger of right hand, detached August 26th. Will send the remaining nails in a few days."

September 19th I received another letter containing seven more nails. They were from the little finger and second and third fingers of left hand, detached September 2d; both thumb-nails removed September 5th; and the nails from the big toes, which were the last to come off, on September 8th.

The remaining nails became so broken while at work that they were useless as specimens.

30th. Cuticle removed from trunk and arms to wrists.

August 1. Cuticle detached from lower limbs to ankles.

2d. Skin taken from right hand in the form of a glove.

3d. Left glove removed. Skin also loose on upper surface of feet ; soles still intact.

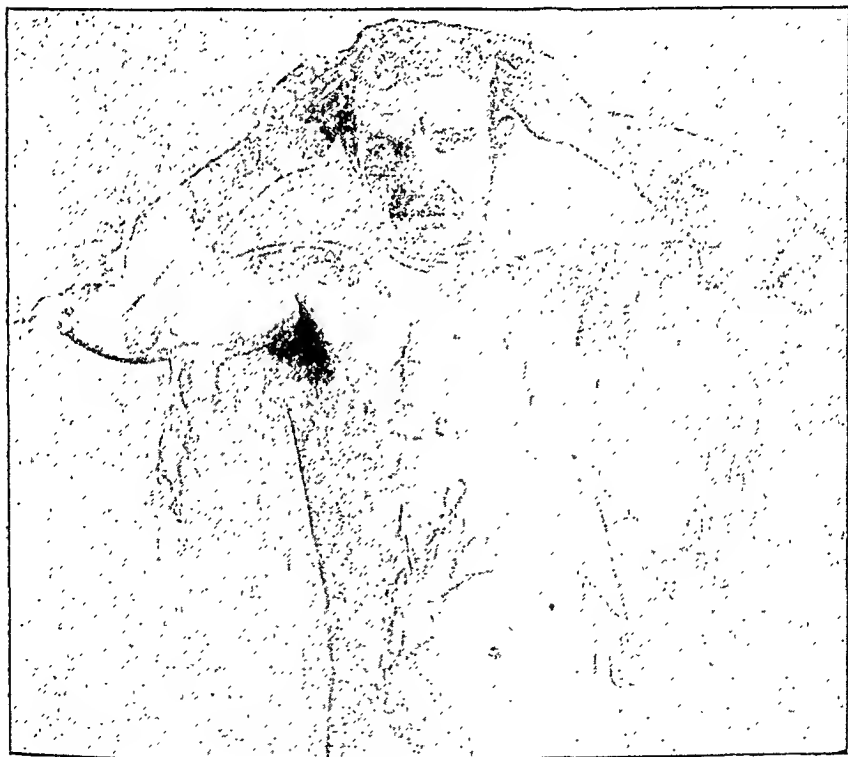
9th. Right moccasin removed.

11th. Left moccasin removed.

After the removal of the cuticle the skin was very soft and delicate, resembling that of a child.

Where the cuticle was thick, as on the palms of the hands and soles of the feet, the new skin was very sensitive, and to protect the feet he wore the moccasins for several days after they had been removed.

At the time of the dismissal of the patient from the hospital, August 15, 1890, it could plainly be seen that the nails would soon be cast off.



New ones were forming at their bases, and the old ones were loosening from the sides and underneath. A thin, blunt instrument could be passed beneath them to their bases without causing pain. Previous to leaving for his home a piece of integument was removed, under cocaine, from his arm, and a careful microscopical examination did not reveal anything abnormal.

intestinal canal, such as soup, eggs, and a small amount of rare beef. Morning and evening she is given drachm-doses of compound licorice powder, until the evening previous to the operation, at which time all medication is discontinued. I specify the drug used since it has appeared to cause less flatus than others which have been tried.

In cases of doubt as regards the accuracy of the diagnosis the patient is examined while under the influence of an anæsthetic. The evening previous to the operation she has another thorough bath, the umbilicus receiving special attention. The pubes and the field of operation above are carefully shaved. A folded towel moistened with a solution of soft soap and water, equal parts, is placed over the abdomen, extending well down over the pubes, and is held in place by means of an abdominal binder. The next morning the patient is given an enema of soap-suds and a vaginal douche of 1 : 5000 bichloride solution. The towel is removed and the surface of the abdomen is washed with 95 per cent. alcohol and afterward with 1 : 1000 bichloride solution. A piece of damp bichloride gauze is now placed over the abdomen and is confined with a few turns of a roller bandage; this the patient wears to the operating-table. If the operation is to be performed in the afternoon, she is given a light breakfast and one hour before the operation one ounce of whiskey. Immediately before the etherization is begun she is catheterized, the urethral orifice having been previously sponged off with bichloride solution 1 : 5000.

The operating-table is an enamelled iron frame covered with two pieces of solid glass, which are inclined to its center, under which is a trough which empties into a basin below. The glass is covered with thick rubber pads.

Previous to the operation the nurses wash the operating-, instrument-, and dressing-tables with bichloride solution 1 : 1000. The instrument- and dressing-tables are covered with towels wet in the same solution. The instruments, with the exception of the knives, the needles, and all ligatures (except the cat-gut sutures) are wrapped in towels and boiled for one hour. The instruments and needles are transferred to glass trays containing a watery solution of hydronaphthol 1 : 1000. The ligatures, including the silver wire, are kept under 95 per cent. alcohol. The catgut used in the hospital is bought in the raw state. After all foreign matter has been wiped off, it is placed in strong ether for four hours. This removes any oily material which may be present. It is transferred from the ether to bichloride solution 1 : 1000, and is allowed to remain for eight hours. It is again wiped off with a bichloride towel and is placed in absolute alcohol. It is kept *under* the alcohol and small quantities are removed from time to time and are placed in the 95 per cent. alcohol, ready for operations. No gut larger than No. 4 is used.

The sponges are also prepared in the hospital. While dry they are

ASEPTIC AND ANTISEPTIC GYNECOLOGICAL SURGERY, AS PRACTISED AT THE ROOSEVELT HOSPITAL.

BY GEORGE W. JARMAN, M.D.,

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RECOGNIZING the fact that many of the profession have either not had the benefit of a hospital training, or else received this training previous to the advent of antiseptic and aseptic procedures, I have concluded that an account of the entire details of operations in some hospital, from the reception until the discharge of the patient, might be of interest to those who have been compelled to "work out their own salvation." In December, 1888, the Roosevelt Hospital established a separate operating-room and reception-ward for gynecological cases, Professor George M. Tuttle having been appointed Attending Gynecologist, and it is from the experience gained in this department that I note the following details.

It has been the endeavor to perfect some plan of operation which would not only meet the requirements of the recent advancements in antiseptic surgery, but would also be practical in its application. Every surgeon must have been confronted with the dilemma of being compelled to depend on those who did not realize the importance of absolute surgical cleanliness, and from this fact it is evident that he must reduce the technique of his operations to a condition of practical utility.

A new operating-room which has been in use for several weeks greatly facilitates the work, which had previously been done in a room twelve by eighteen feet.

To simplify matters, I speak first of major operations and afterward of minor cases.

When a patient has been received into the hospital she is given a thorough bath, including the head; she is supplied with freshly-laundried hospital garments, and a complete history of her previous condition and present illness is taken and preserved for record. A physical examination is made and a description of any abnormal condition ascertained is added to the previous notes. Her urine is examined every morning and the result recorded. The operator is given a card upon the day of operation, showing the existence or non-existence of any abnormal characteristics. The nurse is required to enter daily upon the bedside-notes the temperature, pulse, respiration, and the amount of urine passed. Unless the case is one demanding immediate operative procedure, four to five days are spent in preparing her for the operation. Her diet consists of those articles which will leave the least amount of solid residue in the

Heavy, softly twisted Chinese silk is used for ligating the pedicle. The stump is always seared with a Paquelin cautery and is dusted with iodoform before being dropped back.

Drainage is resorted to if irrigation has been performed. Straight glass tubes, fenestrated throughout the lower third, and long enough to reach the bottom of the cul-de-sac, are employed.

If adhesions have been numerous and oozing persists after the irrigation, iodoform gauze is packed over the raw surfaces and is allowed to protrude from the lower angle of the wound. The wound is closed with No. 24 or 26 silver wire, depending upon the thickness of the abdominal walls. The suture is passed through all the layers, the fascia having been previously drawn forward by the assistant. A provisional wire suture is inserted at the site of the tube if drainage is employed. Interrupted silkworm-gut sutures unite the edges of the skin. This is the constant method in closing the wound, the different layers of the abdominal walls never being united separately.

The wound having been closed is thickly powdered with iodoform and is covered with iodoform gauze. Damp bichloride gauze is placed over this and is in its turn covered with borated cotton. (This borated cotton is prepared in the hospital and is made by boiling absorbent cotton in a saturated solution of boric acid.) The dressings are held in place by three pieces of four-inch rubber plaster, which pass entirely around the body of the patient. A many-tailed abdominal binder, made of muslin, confines the dressings.

If pus has been encountered during an operation, the instruments are scrubbed with soap and water and are boiled for one hour, after which they are wiped dry. Otherwise, they are simply scrubbed in the usual manner.

The drainage-tube has been a source of annoyance and danger to many, and I give in full the method pursued in emptying it:

The tube is filled with strips of iodoform gauze when the operation is completed. Within two hours the tube is emptied. The patient being on her back, the bed-covering is turned down to the lower part of the binder and a light blanket is spread over her chest. These are covered with rubber sheets, over which have been placed damp bichloride towels. The surgeon removes his coat, puts on a clean apron, and disinfects his hands and arms as if he were entering the operating-room. The lower two or three tails of the binder are removed and the dressings are cut down to the tube, exposing the strip of iodoform gauze. Before the strip is removed a piece of bichloride gauze is placed around the opening of the tube. As the strip is removed the gauze is placed over the opening and is kept there until a fresh strip is ready to be introduced. Several strips are inserted and withdrawn until they cease to return from the bottom of the tube stained. A long probe, with a fork on one

pounded lightly to remove the grit, after which they are placed in a solution of permanganate of potash, two ounces to the gallon, and are allowed to remain in this for two hours. They are next washed thoroughly in water and are transferred to a solution of hyposulphite of soda, three ounces to the gallon, to which has been added two ounces of hydrochloric acid, and are kneaded three or four times and at once washed in water until no odor remains. They are now stored in 3 per cent. carbolic solution.

The surgeon and his assistants, including the nurses, pay special attention to cleansing their hands and arms, using a stiff brush and soft-soap, being certain that the nails are thoroughly clean. After this the hands are washed in 95 per cent. alcohol and are then immersed in bichloride solution 1:1000. All then put on rubber aprons and cover these with linen gowns which reach to the feet. Great care is taken that the hands do not come in contact with anything which has not been rendered aseptic. Should it become necessary in arranging the patient on the table to touch parts which are not aseptic, the hands are at once washed in bichloride solution.

The patient being placed upon the table, with her feet on the foot-rest, rubber cloths covered with towels wet with bichloride solution 1:1000 are laid over her, above and below the field of operation. The bandage is then cut and the gauze is removed. The abdominal surface is sponged off with 95 per cent. alcohol, followed with bichloride solution 1:1000, no scrubbing-brush being used. Bichloride towels are fastened on either side of the field of operation, thus excluding all other portions of the patient's body. The operator and his assistants have near them two basins, the first containing bichloride solution 1:1000 and the other distilled water. From time to time during the operation the hands are dipped in the first and then in the second basin. The sponges are all counted previous to the operation and the number is noted on a blackboard, and before the wound is closed the nurse is required to account for all sponges used. A reserve set of sponges is always in readiness, so that if pus is encountered fresh sponges may be used after the irrigation.

Irrigation is resorted to under two conditions—if much oozing exists from the separation of adhesions, or if any septic (or possibly septic) matter has escaped into the peritoneal cavity. Distilled water only is used for this purpose, at a temperature of 112° F. A glass irrigator, holding three quarts, to which is attached by means of rubber tubing a glass nozzle fourteen inches long, with a smooth end, slightly curved, is the apparatus used. The tubing and the nozzle are always boiled with the instruments.

During the operation instruments not in use are kept under the hydro-naphthol solution.

In ordinary cases the patient sits up on the fourteenth day, and is allowed to leave the hospital on the twenty-first. But one patient during the past two years is known to have had a ventral hernia following laparotomy, and in this the fascia evidently was not carefully brought together at the upper angle of the wound. It is believed that this unusual freedom from herniæ is due to the care exercised in drawing the fascia well forward before the needle has penetrated the tissues.

A diagrammatic temperature and pulse chart is kept during the entire convalescence. A system of bedside notes indicating the exact condition of the patient, the number and character of the movements, and the amount of urine, is also kept. A specimen of the urine is tested, chemically and microscopically, every morning for one week following the operation, and longer should it contain any abnormal element.

The same care in regard to absolute cleanliness is carried out with minor operations. The preparation of the operating-room, the disinfection of the patient and arms and hands of the operators, is the same as in major cases. In lacerations of the perineum through the sphincter the patient is subjected to treatment previous to the operation for at least five days. The bowels are freely opened and only fluid diet is allowed. The vagina is douched daily with 1 to 5000 bichloride solution. The perineum and adjacent parts are shaved and a damp bichloride pad is placed over the field of operation. After the operation the patient is catheterized every eight hours. The catheters used are made of glass, and are frequently boiled and kept in a bichloride solution. The nurse is required to carefully disinfect the urethral orifice before the catheter is introduced, and to place the tip of the finger over the end of the catheter before it is withdrawn, thus preventing any urine from escaping from the eye of the instrument. One or two small doses of opium are given after the operation to relieve the pain and to quiet any peristaltic action of the intestines. The wound is powdered frequently with iodoform, and a dry iodoform pad is kept over the parts by means of a T-bandage, and kept as dry as possible. The bowels are moved on the fourth day. On the evening of the third day one drachm of sulphate of magnesia is given at intervals of an hour until three doses have been administered. The next morning, if the bowels have not moved, one-half ounce each of castor oil and glycerin is given. The nurse is instructed to give the patient an oil enema as soon as any desire to have a movement is expressed. The enema is always given, both in these and other cases, through a soft rubber stomach tube, to which has been attached a funnel, by means of rubber tubing. The fluid to be administered is poured into the funnel and is allowed to appear at the eye before the tube is introduced. From this time forward the patient's bowels are kept open. The stitches are removed on the ninth or tenth day. During the past two years no failure of union of the sphincter has occurred.

end, is a simple and efficient means of carrying the strip to the bottom of the tube. The iodoform strips are kept in small glass jars, and no one is allowed to touch them whose hands are not perfectly clean.

These dressings are renewed, according to the amount of fluid present, at intervals of from two to four hours. As soon as a second or third strip used at any one dressing returns dry the tube is removed and the provisional wire is twisted. Should the gauze be used to pack any raw surfaces within the peritoneal cavity, it is removed as soon as the tube becomes dry, the latter being left for several hours after, in order that any fresh fluid which accumulates after the withdrawal of the gauze may be drained away.

Nothing is given the patient by mouth during the first twelve hours following the operation except small quantities of hot water to relieve the thirst. If she is suffering much pain, three or four minims of Magendie's solution of morphine are administered hypodermically. When the patient ceases to experience any nausea from the ether, small quantities of milk and lime-water are allowed, which amount is gradually increased according to circumstances. Nourishment is never given except at intervals of two hours.

An attempt is made to move the bowels as soon as any untoward symptoms, such as a rapid pulse, undue rise of temperature, vomiting or abdominal distention develop. Otherwise the bowels are moved on the third day. A one-grain calomel triturate, given every hour for three or four doses, is the medication usually resorted to, it having been found that the stomach shows a greater tolerance of this than other drugs that have been tried. In fact, it has appeared that the calomel in many instances has checked vomiting. An enema is administered eight or ten hours after the first grain of calomel has been given. Little or no medication is used after the operation, unless urgent symptoms arise which demand it. Nothing but fluid nourishment is given during the first week.

The sutures are removed on the eighth day, and the same antiseptic precautions are used as when the operation was performed. The patient is covered above and below the binder with damp bichloride towels spread over rubber sheets. The hands and arms of those who are to touch the wound or dressings are carefully disinfected and the instruments are boiled. The dressings are removed and the wound is sponged off with bichloride solution. After the sutures have been removed, the wound is again powdered with iodoform and a similar but lighter dressing than the primary one is adjusted. Great stress is laid upon the dressing being an occlusive one, and a mural or stitch-hole abscess is of rare occurrence in the ward. The second dressing is not removed for one week, after which all dressings are discarded and the patient is required to wear an abdominal binder.

REVIEWS.

A TREATISE ON THE DISEASES OF THE NERVOUS SYSTEM. By WILLIAM A. HAMMOND, M.D., Surgeon-General U. S. Army (Retired List), etc., with the Collaboration of GRAEME M. HAMMOND, M.D., Professor of Diseases of the Mind and Nervous System in the New York Post-Graduate Medical School and Hospital. Ninth Edition, with corrections and additions. New York, 1891.

DR. HAMMOND'S book holds a unique place in American medical literature. It was the first systematic treatise on diseases of the nervous system to appear on this side of the Atlantic. In fact, it was the first treatise of importance on its subject in the English language, for, if we except a few works which scarcely rose above the dignity of monographs, and the antiquated work of Abercrombie, the English themselves had produced no special treatise at the time (1871), when Dr. Hammond's first edition appeared. Certainly, if we except the somewhat fragmentary writings of Prichard and Marshall Hall, they had produced none to compare in value and completeness with the older work of Romberg, and the almost contemporary treatises of Rosenthal and Hammond. Their general medical text-books doubtless contained much excellent and some original writing on nervous diseases. The contributions to Reynold's *System* for instance were of enduring value, but they were the works of numerous hands, and were inaccessible to many in that encyclopædia. Long before this time Sir Charles Bell had stimulated to an unusual degree the study of nervous diseases, but his own writings were largely anatomical and physiological, with a decided surgical bias. He himself said: "I fear it will be a long time before combined efforts will enable a medical author to arrange and accurately describe the diseases of the nervous system." It is noteworthy that an American author was the first to fully realize in the English language this brilliant scheme.

Dr. Hammond's book has enjoyed an unprecedented popularity with the profession, not only because it was the first to take the field, but also because of the striking personality of the author and the force, not to say dogmatism, with which he expresses his opinions. This ninth edition is an evidence of this popularity. It is also an evidence of the confidence which a successful author comes to feel in the continued indulgence and applause of his readers; because the book in some of its parts is not presented in the thoroughly revised and amended shape which both its past record and the exigencies of the present time demand. This is the more to be remarked because the author has had the collaboration of his son, whose experience and ability amply fit him for, as his natural pride must incite him to, the congenial and profitable task of revision. Dr. Hammond's treatise no longer enjoys the field alone. It has many,

Many cases of incomplete abortion are treated in this hospital and no labor is spared to render the patient and the operation as aseptic as possible. When such patients are received, if active hemorrhage is not taking place, they are given a thorough bath. The pubic and perineal regions are shaved. The condition of the heart is determined and a specimen of the urine is tested. Should these examinations justify it, the patient is anæsthetized. A thorough vaginal douche of 1 to 5000 bichloride solution is given. The surgeon, having rendered his hands and arms thoroughly aseptic, and wearing his operating-gown, proceeds to determine the condition of the os. Should he be unable to introduce his finger well into the cavity of the uterus, the os is forcibly dilated with a steel dilator.

When the product of conception is adherent, as much as possible is removed with the finger. A dull curette is used to free the cavity of any small fragments which may have escaped the finger, but the *finger* is always employed to determine the condition of the endometrium. The uterine cavity being empty, is irrigated through a double-current catheter with 1 to 10,000 bichloride solution at a temperature of 112° F. This usually causes firm contraction and a cessation of hemorrhage. In those cases in which the pregnancy is advanced beyond the fourth month and in which, by reason of lack of tone of the uterine tissue contraction fails to take place, strips of iodoform gauze are packed firmly into the cavity. It is the custom to operate upon all cases of incomplete abortion as soon as they enter the hospital.

No matter how slight the operation may be, the same scrupulous care is taken that everything coming in contact with the wound shall be absolutely clean. To secure this end, it will be seen that antiseptic and aseptic principles are combined—antiseptics previous to the operation, antiseptics in conjunction with asepsis during the operation, and asepsis after the operation.

cases, together with the merely theoretical and dogmatic statements in the book, could have been much curtailed, or even entirely replaced, by more careful descriptions of the morbid anatomy, symptoms, and natural history of some of the more recently studied diseases. Some space also could have been gained thus for detailed anatomical studies of the central nervous system, in which the book is rather lacking.

We have indicated what appear to us to be a few lingering defects in a book whose reputation is already thoroughly established. Its merits have long spoken for themselves. In succeeding editions, which we hope to see, the younger Hammond will no doubt see to it that the work is kept well abreast of the times, and that it continues to sustain the reputation of its author.

J. H. L.

SURGERY: A PRACTICAL TREATISE, WITH SPECIAL REFERENCE TO TREATMENT. By C. W. MANSELL MOULLIN, M.A., M.D. Oxon.; Fellow of the Royal College of Surgeons; Surgeon and Lecturer on Physiology to the London Hospital; formerly Radcliffe Travelling Fellow and Fellow of Pembroke College, Oxford, England: assisted by various writers on special subjects. Five hundred illustrations. Pp. 1180. Philadelphia: P. Blakiston, Son & Co., 1891.

THE aim to make this valuable treatise practical by giving special attention to questions of treatment has been admirably carried out. Many a reader will consult the work with a feeling of satisfaction that his wants have been understood, and that they have been intelligently met. He will not look in vain for details, without proper attention to which he well knows that the highest success is impossible. As is quite proper at the present day, in a treatise on general surgery, little space is given to such departments as diseases of the eye, ear, larynx, skin, etc., and these subjects are treated by those specially fitted to do so.

The germ theory, in its application to surgery, receives the fullest acceptance. Septic fever and sapræmia (from absorption of ptomaines) are described as due to non-infective organisms, while true septicæmia is due to an infective germ. It is practically impossible to separate them clinically. Ulcers are classed with abscesses, as due to infective organisms. A burn, for instance, does not leave an ulcer, provided no other irritant is allowed to appear. Traumatic fevers should be clearly separated from those which are due to septic decomposition. Two forms are described: one, neurotic, as from emotion or peripheral nerve irritation; the other, caused by absorption from the wound of products probably related to the coagulation process.

Rabies is a specific disease for which "the only treatment of any service at all is the inoculation plan, discovered and perfected by Pasteur, and by which he has succeeded in reducing the mortality to 1.47 per cent. on the whole number (2164); and to a very much lower figure still, if only the later cases and those which applied for treatment soon after the injury are reckoned."

The use of antiseptic solutions is discussed in a very sensible way from the standpoint of practice, rather than of theory.

and some very formidable, rivals, and is bound to be measured by a standard which has changed much since 1871.

We have compared this with the fifth edition of 1881—the only one at hand—and find it practically almost the same. The former contains just two pages more than the latter, and most of these pages are identical, and printed apparently from the same stereotyped plates. It is thus seen that the book is rather a reprint than a new edition. How far haste of publication is responsible for this we do not know, but it is unjust to the merits, the reputation, and the claims of Dr. Hammond's treatise. Neurology is certainly a progressive science, and has made some notable advances during the last decade. The traumatic neuroses, we venture to say, are no longer in any other modern work treated of as anæmia of the posterior columns and of the antero-lateral columns of the spinal cord, according as they are respectively irritative and paralytic. This whole subject, which was elaborated by Dr. Hammond in his earlier editions with much plausibility and wealth of quotation from older writers, appears now in this edition rather antiquated. The author's position is certainly untenable. Again, cerebral localization, with its practical application in diagnosis and surgical treatment, has made great progress in ten years. The clinical work alone, done on this basis, has held the attention of the profession during that time as scarcely any other subject has done. It seems to us that the author has not done entire justice to this subject in his book. So, too, of multiple neuritis. Both the novelty and importance of the disease merit more than the cursory mention it receives in Dr. Hammond's book.

The relation of the infectious processes to various diseases of the nervous system is not ignored by Dr. Hammond. Tetanus is ascribed in this edition to the bacillus of Bonome. The researches of Pasteur in hydrophobia, however, are not credited with any definite results, and are dismissed with a very brief notice, while the description of the disease is long and diffuse, as in the former edition, and in itself presents nothing new. We have looked in vain for any adequate account of post-diphtheritic paralysis, and the various interesting nerve-lesions following other infectious diseases, as well as the acute delirious states occurring then, which could well be described in such a comprehensive treatise. These paralyzes are briefly referred to, and classified under the head of anæmia of the antero-lateral columns of the cord—a pathology which is unreasonable, and, as the author himself says, has never been proved.

The chapter on syringomyelia has been added to this edition. The author inclines to the opinion that the majority of cases develop in subjects whose spinal cords were previously normal. Bruhl, however, has shown in his recent monograph that the congenital origin of these cases is most probable, and suggests the name *gliomatosis* for the proliferation of gliomatous tissue about the central canal in badly developed cords. to which class of cases he would confine the term. We have searched carefully but have found no description of Friedreich's disease of porencephalus or of the cerebral palsies of children.

Dr. Hammond's treatise will continue to meet with favor in the profession—to which its author therefore, owes the tribute of a careful revision of its successive editions. We believe that some of its pathology could have been profitably rewritten in this ninth edition, and that the many long quotations and detailed descriptions of the author's own

ELEMENTS OF PRACTICAL MEDICINE. By ALFRED H. CARTER, M.D. Lond.; Member of the Royal College of Physicians, London; Physician to the Queen's Hospital, Birmingham; Emeritus Professor of Physiology, Queen's College, Birmingham, etc. Sixth edition, 8vo, pp. xvi., 496. London: H. K. Lewis, 1891.

By brevity and condensation Dr. Carter has skilfully gotten a vast deal of material into a relatively small compass, and this, too, without more than the inevitable sacrifice of accuracy or completeness. The present edition contains, in addition to the sections on general diseases, diseases of the respiratory, circulatory, alimentary, urinary and nervous systems, chapters on general pathology and diseases of the skin. At the conclusion of the work is a therapeutic index.

A number of minor defects and omissions do not materially impair the value of the book. The organisms of Laveran receive no recognition in the discussion of malarial fevers; nor is reference made to the pernicious types of malarial infection, hemorrhagic malarial fever, the cerebral, pulmonary and gastric forms. The great value of morphine and pilocarpine, given subcutaneously, in aborting the paroxysms of these grave malarial fevers is also not mentioned. The subcutaneous injection of pilocarpine also acts with almost specific certainty in erysipelas. It is rather doubtful if so-called gonorrhoeal rheumatism will yield to treatment useful in acute articular rheumatism. In the treatment of syphilis, mercury may be applied not only by inunction, fumigation, and internal administration, but also by subcutaneous injection.

That a section should be devoted to the general subject of carcinoma finds warrant in the statement that "it yet remains to be settled whether, on the one hand, the newgrowth is but the local expression of a constitutional taint; or, on the other, whether it is primarily a local disorder, and only affects the general system secondarily." In the symptomatology of diseases of the stomach a description is given of "pain," which the probable omission of a word makes the text say "is altogether absent." The smooth, white kidney and the granular, contracted kidney are given as the representatives of chronic Bright's disease, and a common treatment is prescribed for both. We are accustomed to believe that while iron is useful in the one case, it is hurtful in the other. The lardaceous kidney is recognized as a distinct form, but nothing is said of the occurrence of waxy casts in the urine. It is true that we have no medicinal treatment for chyluria, but the disease can be cured by removal to a climate in which the filaria cannot live. The subject of dengue may have been omitted because the disease occurs only in tropical countries, but the same limitation does not apply to tetanus, which is as much deserving of a place in a work on practical medicine as is hydrophobia. Notwithstanding the foregoing criticisms, the book bears the stamp of a careful observer, an accurate recorder and a versatile writer, and can be confidently commended to the student as an "introduction to the study of systematic medicine."

A. A. E.

In the controlling of hemorrhage from deep-seated wounds, as those of the vertebral artery, packing from the bottom with iodoform gauze is advised, instead of attempting ligation. Punctured wounds of the deep plantar and palmar arches are to be treated by pressure. In the treatment of spina bifida, the author thinks that excision of the sac should very rarely be undertaken, and says that the only treatment which has met with any success is that of injection.

The work is especially rich in material which concerns the injuries and the diseases of bones and joints, to which is devoted one of the most admirably prepared and valuable portions of the book. An excellent chapter is that devoted to the treatment of fractures. The details of manipulation are so described, and such attention is paid to minor points, that anyone can follow out intelligently the advice given. The skilful use of a splint may be much more important than the shape or variety used. The writer is very fond of the plaster-of-Paris dressing; sometimes used from the first, with proper selection of cases, and immediate cutting, or in almost all cases after the first few days. Details given as to proper application are most practical. In the treatment of compound fractures the general attitude is toward a wise conservatism, determined by the light of modern methods. Compound fractures entering the knee-joint, as well as those of the thigh, still usually call for amputation, in spite of antisepsis, when they are due to direct violence. The limb can usually be saved, however, when the injury has been indirect.

After fracture of the spine, operation is opposed when indirect violence has caused the injury. The argument for this is hardly proven—that “the injury to the nerve structures is either so slight that an operation of such a nature is not justifiable, or so severe that it could do no good.” In fracture by direct violence, on the other hand, “the operation should certainly be performed at once,” if compression is suspected, without destruction of the cord. Especially is this advised in injuries of the cauda. He quotes the statistics of Thorburn—sixty-one trephinations for injury, only one a complete success; in seven only a *bona fide* improvement, and in six of these the improvement was in the cauda.

The operation for radical cure of hernia after herniotomy is looked upon with favor, Macewen's method being especially approved.

In acute intussusception, if enemata fail, laparotomy is advised within the first twenty-four hours, just as herniotomy is done if taxis fails.

In acute obstruction of the bowels laparotomy is to be done as soon as the diagnosis is definite, other treatment being worse than useless. As an important feature of the operation the author refers to the strong advice of Greig Smith to empty the overdilated bowel of gas by an incision or the use of a large trocar. This enormous distention will alone continue the obstruction by causing acute flexures.

No fewer than 200 of the 500 illustrations have been prepared expressly for this book. They are for the most part excellent in that they show clearly what is intended to be shown, which is of greater importance than size or display of workmanship.

The author's name is spelled with one “l” on the cover and with two on the title-page.

G. E. S.

use, and of those medical men who have turned their attention to the subject." The latter include such eminent Englishmen as Drs. B. W. Richardson and Lionel Beale. The author is evidently an enthusiastic 'cyclist, who regards 'cycling as a first-rate remedy for a large number of ailments, some of which are varix, rheumatism, gout, obesity, constipation, diabetes mellitus, and various functional nervous disorders. The subject is presented so attractively that one can scarcely resist the desire to become a 'cyclist, and thus enjoy some of the many benefits accruing from such invigorating exercise. The healthfulness of 'cycling and its superiority over indoor gymnastics is due to the open-air life the 'cyclist leads, with sufficient exercise to properly employ the body and mind. It is superior to walking, since it is less monotonous and fatiguing, and is generally to be preferred to horseback exercise; because of its being far less expensive and troublesome. The book is well worth a perusal by those who have patients with rebellious ailments arising from too sedentary living.

The appearance of a second edition of *Madeira and the Canary Islands* in a surprisingly short time after the issue of the first may be accepted as a sufficient guarantee of its excellence, and that it fills the niche justifying its publication. It is intended, not alone as a *vade mecum* for travellers, but as a guide-book to physicians and laymen who desire complete condensed information concerning these islands as a health resort.

Strathpeffer Spa: Its Climate and Waters, its author informs us, is prepared for medical men and laymen interested in Strathpeffer and the Spa. It is, we should judge, an important contribution to the better knowledge of this health resort, and as such we commend it those who have in mind a visit to Strathpeffer.

D. D. S.

A GUIDE TO THE CLINICAL EXAMINATION OF THE URINE. By FARRINGTON H. WHIPPLE, A.B. Harv. 8vo, pp. x., 206. Boston: Damrell & Upham, 1891.

THE "aim in writing this little book" is stated as having been "to condense the essential features of larger and more diffuse books, and to present the subject in a more readily accessible and practical form," and in this aim the author has creditably succeeded.

At a time in the past not beyond the range of memory, examination of the urine was made only in obscure cases, and when the symptoms suggested the existence of derangement in the genito-urinary tract, and especially of the kidney. Now, however, such examination is almost universal in hospital practice, and quite general in private practice; so that the investigation of a given case is not considered complete without a knowledge of the condition of the urinary secretion; while the obstetrician who neglects to repeatedly examine the urine of a pregnant woman is held guilty of culpable neglect. With this advance in clinical study, manuals on the subject have multiplied, and thorough works on the practice of medicine devote considerable space to its discussion.

It should be borne in mind that the presence or absence of albumin in the urine is not always conclusive as to the existence or non-existence of disease of the kidney. Casts may be found when it had not been possible to detect the presence of albumin; and examination of urine from an unequivocal case of nephritis will, from time to time, fail to detect the presence of either albumin or casts.

We do not believe that a clinical distinction between hyperæmia and inflammation of the kidney can be maintained. The presence of albumin and casts in the urine must be accepted as evidences of inflammation, from which, of course, recovery may take place, without leaving clinical traces of previous disease.

The subject of acetone is not at all referred to.

A. A. E.

'CYCLING AND HEALTH—LA SANTÉ PAR LE TRICYCLE. By OSCAR JENNINGS, M.D. Paris, M.R.C.S. Eng. Translated from the French, third edition, Paris, 1889. By J. CROSSE JOHNSTON. Pp. 244. London: Iliffe & Son.

MADEIRA AND THE CANARY ISLANDS. A PRACTICAL AND COMPLETE GUIDE, FOR THE USE OF INVALIDS AND TOURISTS. With nine maps. By A. SAMLER BROWN. Second edition. Pp. 130. London: Sampson Low, Marston, Searle & Rivington, Limited, 1890.

STRATHPEFFER SPA: ITS CLIMATE AND WATERS. WITH OBSERVATIONS HISTORICAL, MEDICAL, AND GENERAL, DESCRIPTIVE OF THE VICINITY. By FORTESCUE FOX M.D. Lond., Fellow of the Medical Society of London. Pp. 165. London: H. K. Lewis, 1889.

'*Cycling and Health* contains, in epitome, the opinions concerning the 'cycle, "both of those invalids who have recovered their health by its

frequently complain of local numbness, more especially of portions of the skin of the lower extremities. Numbness and tingling of the soles of the feet are by no means infrequent symptoms.

It is a very important question, especially in reference to chronic skin diseases requiring its use during long periods, whether arsenic is prejudicial or otherwise to the general health. If given in small doses, with the exception of the risk that it may cause shingles, its effects are usually inappreciable, and there is no danger of its cumulative influence. If arsenic be given in full doses for long periods, although it may be doubted whether there is any reason for styling it a cumulative drug, its employment is not without danger. There are certain symptoms which ought to lead us to take alarm. If the patient has numbness of any particular part of the skin, or if there be decided loss of flesh, then it ought to be suspended. Irritation of the conjunctiva is, of course, a well-known symptom of disagreement, but it may not be observed as frequently as some of the others just mentioned, and to them may be added a liability to diarrhoea, and, in a certain number of cases, extreme irritability of the bladder.

Under regular medical supervision a patient cannot well receive injury to his general health from arsenic. If, however, a patient who has received great relief from his skin affection has obtained a prescription which he uses on his own responsibility, and with perhaps considerable increase in the dose ordered, it is then possible that serious or even fatal results may ensue.

As regards the influence of arsenic on the skin in persons previously healthy: Now and then we have opportunities to observe its action upon the skin when it is prescribed for maladies quite apart from the skin itself. Its effects upon the nutrition of the skin, if the doses are large, is to make it brown and muddy-looking; it is also dry and harsh on the trunk and limbs generally, although there may be perspiration on the palms and soles. The discoloration may be attended with actual pigmentation, and may increase until it almost resembles the tint of Addison's disease.

In extreme cases not only is there dryness and discoloration, but scaly patches may form on the knuckles, elbows and knees, much resembling common psoriasis, but less well circumscribed. A much commoner result than this is, however, disturbance of the nutrition of the skin, not over the body generally, but over the palms and soles only. On these parts, in addition to dryness, corns may form, and in certain very rare cases these corns pass on into epithelial cancer. A peculiarly dry condition of the palms and soles, with tendency to the formation of corns, is by no means an infrequent result of long-continued courses of arsenic, and should lead to its discontinuance.—*British Medical Journal*, No. 1588, 1891.

OPIATES IN ACUTE PERITONITIS.

DR. STEPHEN SMITH directs attention again to the importance of large doses of opium in treating acute peritonitis.

Under Professor Alonzo Clark's direction he treated six cases in 1840. The patients were seen every hour, the pulse and respiration closely watched. The quantity of opium was to be determined by the effects produced, not at all by the amount administered. The condition of the patient to be secured

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF
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ARSENIC AS A DRUG.

In a lecture on this subject DR. JONATHAN HUTCHINSON points out some of the conditions under which this remedy is of especial service. It appears to possess specific power in persisting pemphigus. As a rule, no fresh bullæ are produced after the administration of the arsenic has been commenced, and the patient quickly regains health, with perfect soundness of skin.

In the treatment of common psoriasis, although the effect of arsenic is quite as definite and certain as in pemphigus, it is not nearly so immediately curative. Sometimes its effects are first manifested by the patches taking on a congested condition, and becoming very irritable. In a large majority of cases it will, in the end, if well pushed, cause the eruption almost wholly to disappear. It seldom or never brings about a complete cure, and of late years we have been so much accustomed to reinforce it by efficient local measures that it is not always easy to estimate the proportion of our indebtedness to it.

As a tonic arsenic should be used only in small doses. In elderly persons, unless the disease imperatively demands it, it should not be prescribed. With the young, arsenic appears usually to agree well, and even very young children, although they but seldom need it, will bear full doses without ill effects. Amongst the facts which have been thoroughly established as regards the possible effects of arsenic it may be claimed that it is an undoubted cause of peripheral neuritis. Its influence in inducing herpes zoster, when given for the cure of other skin diseases, affords the most common example of this. It has been observed by those studying cases of poisoning by arsenic, and is especially noted by Christison, that local and unsymmetrical forms of paralysis not very infrequently result. During its medicinal use patients not in-

be increased if the opium symptoms diminish, or discontinued if narcotism is approaching. The duration of the treatment will be sometimes no more than two or three days; it may be a week, or even a fortnight; and in one case the symptoms persisted mildly for forty days and then yielded. In this case the medicine used was sulphate of morphine, and the enormous dose reached, by steady and gradual increase, was one grain and a quarter every forty minutes, in a boy ten years old.

Of the several signs of opiumism there is none more valuable than the frequency of the respiration; and while the physician aims to reduce it to twelve in a minute, there are chances that he will see it fall to something below that.

Professor Clark does not explain the curative action of opium in peritonitis, but Professor Fordyce Barker, who had a large and varied experience in puerperal peritonitis in Bellevue, considered opium the most important of all agents in arresting and controlling this disease. By it the peristaltic movements are retarded or arrested, and thus the inflamed tissues have absolute rest, pain is annulled, emotional excitement is allayed, the nervous system is tranquillized, sleep is secured, and thus the depression of the vital forces resulting from the shock of the attack is lessened.—*Medical Record*, vol. xxxix., No. 22, 1891.

CACTINA.

Cactina is the proximate principle of the plant *Cereus grandiflora*, which is indigenous in tropical America. It is unirritating, a 10 per cent. solution applied to the conjunctiva produces no noticeable effect.

It is thought to increase the heart's energy and increase the blood-pressure in this way and also through stimulation of the vasomotor centre. It is said to resemble strychnine in its action upon the motor centres of the cord.

Clinical observation suggests that its greatest value is manifest in functional disturbances of the heart, as simple dilatation and cardio-muscular atony, without organic lesions. A special indication for its use is during the critical periods of adynamic fevers, as it combines the elements of a heart and spinal motor stimulant.

Unlike digitalis, cactina may be administered continuously without fear of exciting gastric disturbance, and the objectionable cumulative action of the former drug is entirely absent. It may be employed in all varieties of functional cardiac disease and circulatory disturbances, and in organic heart disease, except in cases of mitral stenosis, where digitalis is to be preferred on account of its power of prolonging the diastolic period. In aortic insufficiency the short diastole produced by cactina allows no time for regurgitation of blood into the ventricle, whereas digitalis, by prolonging the diastolic period, favors just what we should seek to prevent.—*New York Medical Journal*, vol. liii., No. 24.

HÆMORRHOIDS.

Iodide of potassium	.	.	.	.	.	.	.	5ss.
Iodine	.	.	.	.	.	.	.	grs. viij.
Glycerin	.	.	.	.	.	.	.	5j.

was that of semi-narcotism ; this was to be determined by the degree of stupor and the respiration ; the patient must require to be shaken to be aroused to consciousness ; and the respiration might fall to twelve per minute, but not below that figure.

At the outset each patient received one grain of opium every hour for three doses. No effect being perceptible, the dose was increased to two grains every hour, and continued for three doses. Failing with this dosage, the opium was increased to three grains every hour. In four cases this amount of opium had the desired effect, and it was continued in that amount. In the remaining cases it had to be increased to four grains every hour. One of these remaining cases yielded to this amount, and the opiate was continued at that rate. The sixth case was much more obstinate, and the opium was steadily increased until the dose reached was twelve grains every hour. This amount simply secured a light but continuous sleep, from which she readily awoke on placing the hand upon her wrist to examine her pulse.

The first four cases continued to receive three grains of opium every hour for three or four days, when the pulse fell to its normal standard, the tympanites subsided, the tenderness of the abdomen disappeared, and the patients were evidently convalescent. The opium was discontinued. They rapidly recovered and remained well.

In the fifth case, on the fourth night the patient was given so much opium, four-grain doses, that she was too deeply narcotized ; she was without pulse, pale, and with only four respirations per minute. Active measures were taken to recover the patient from her profound narcotism. After several hours of continuous effort she was regarded as securely restored. All symptoms of peritonitis now rapidly subsided ; the pulse had fallen from 112 to 92 per minute, the tympanites and tenderness had disappeared, and she expressed herself as feeling well. Within twenty-four hours all evidences of peritonitis recurred, and the treatment was renewed, three grains of opium being given instead of four. Semi-narcotism was readily produced, and after a brief period the symptoms again subsided ; the treatment was suspended, and she was perfectly cured.

The sixth case proved an anomaly in tolerance of opiates. During twelve days the treatment was persevered in, the pulse remaining at about 120, the respirations 34 to 36, the abdomen greatly distended and tender to the touch, lancinating pains, the features pinched, perspiration at intervals, etc. During these twelve days the patient took the equivalent of 1950 grains of opium, and she neither vomited during that time nor had an evacuation from her bowels. At no time was she so narcotized that she would not awaken when a hand was placed upon her wrist. She remained in the hospital as an assistant in the laundry for six months after her recovery, and during that time she was in excellent health.

Professor Clark thus describes the method of medication : The plan is to begin with a dose that is safe, say two or three grains of opium, or its equivalent of sulphate of morphine, and in two hours notice its effect. If any of the opium symptoms have appeared, repeat the dose, if not, increase by one grain, and so on at intervals of two hours till the degree of tolerance in the patient is ascertained. After that the case can be treated by a diminished occupation of the physician's time—two or three visits a day. The dose is to

in a spiral course involving its entire circumference and occupying the interval between two large calcareous plates. The margins of the torn surface were scarcely separated, and the peri-aortic connective tissue was infiltrated with blood, but at no point was the tear incomplete. The hemorrhagic infiltration extensively involved also the mediastinal connective tissue. It formed an ecchymotic area at the level of the third, fourth, fifth, and sixth dorsal vertebræ, to the left of the spinal column. The orifice of communication between the aorta and the pleural cavity could not be found.

Dürr has succeeded in collecting from the literature twenty-eight other cases of rupture of the aorta, in addition to the twenty-eight reported by Broca, the eighty reported by Peacock, and the fourteen reported by Pilliet. An analysis of these cases leads him to arrange them in three groups: 1, those without the production of dissecting aneurisms, which are rare; 2, those with the production of dissecting aneurisms, which are relatively common; and, 3, those with the production of true aneurismal sacs, which are exceedingly rare. Spontaneous ruptures of the aorta are more common in men than in women, and especially common at advanced age. In many cases no exciting cause has been apparent; in some it was slight, and in others, violent effort, anger, emotion, or a large meal acted as a cause of rupture. Death may occur suddenly; or slowly, at once; or slowly in two periods, separated by an interval. The first is uncommon; the second, the least common; the third, the most common. The most usual seats of rupture, in the order of frequency of occurrence, are the origin of the aorta, its ascending portion, the beginning of the arch or the origin of the innominate, the horizontal portion, the termination of the arch and the beginning of the descending portion of the thoracic aorta, and, finally, the abdominal aorta. The rupture is generally transverse. The blood is usually discharged into an adjacent cavity—most commonly into that of the pericardium; much more rarely, into the left pleural cavity; occasionally, into the trachea or into the œsophagus. Sometimes the blood finds its way only into the peri-aortic and mediastinal connective tissue or beneath the left pleura, forming a tumor in the thoracic wall between the left lung and the pericardium. The most common anatomical cause of rupture is atheroma of the aorta, often associated with dilatation. In the majority of cases the left ventricle is hypertrophied. Valvular lesions may or may not coexist. The diagnosis is scarcely possible. There may be severe pain in the pre-sternal region and between the shoulders, with intense anxiety and distress, while respiration remains normal and percussion and auscultation disclose no abnormality in the pulmonary functions.

SUDDEN DEATH FROM RUPTURE OF VARICES OF THE HEART.

JOURNIAC (*La Médecine Moderne*, 1891) reports the case of a man of fifty-five, coming under his observation with delusions of persecution associated with hallucinations, probably of alcoholic origin. These manifestations speedily disappeared, a condition of dementia remaining. Nothing of note transpired during a period of more than five years. At the end of this time the patient was suddenly seized with loss of consciousness of brief duration, three or four seizures occurring rapidly in succession. A number of months

Small plugs of cotton steeped in this solution are applied every three or four hours to the piles.

By this treatment the inflammation subsides, and the hæmorrhoids diminish rapidly in volume, and finally disappear.—*Medical Press*, June, 1891.

MEDICINE.

UNDER THE CHARGE OF

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SUDDEN DEATH FROM SPONTANEOUS RUPTURE OF THE AORTA.

MARTIN-DÜRR (*Archives Générales de Médecine*, 1891) reports the case of a woman of eighty-seven, who, two hours after dinner, was suddenly seized with pain in the back, on the left, which apparently subsided under treatment, though a sense of oppression of the chest and slight dyspnœa continued without disturbance of the respiratory rhythm. The intelligence was preserved throughout. Suddenly, two and a half hours later, the pain returned, and death took place immediately by syncope. At the autopsy, between the cæcum and the right kidney was found a cyst as large as an orange, with delicate, translucent walls, containing clear, limpid fluid of lemon-yellow color and highly albuminous. The splenic artery was as large as a little finger, extremely tortuous, nodulated and atheromatous; the liver was small and fatty; the gall-bladder contained a small cubical calculus. On removing the liver no blood flowed from the inferior vena cava. The internal and external iliac arteries and the abdominal aorta were in a high degree atheromatous. The right lung was emphysematous, adherent at the apex, and completely filled the pleural cavity. The pericardium was displaced toward the median line, and the lung pushed forward and upward. The left pleural cavity was filled with an enormous quantity of sanguinolent fluid and considerable clotted blood. The left lung was free, compressed, but crepitant. The pericardium and its cavity were normal. The heart was not hypertrophied, but laden with fat. The walls of the left ventricle were pale and of moderate thickness. The cavity of the heart contained neither fluid blood nor clot. The mitral orifice was normal; on the aortic valves were some calcareous nodules. The aorta was enormously dilated and contained numerous atheromatous patches. At the junction of the horizontal and descending portions, a little beyond the origin of the left subclavian artery, was an extensive opening almost four inches long, transverse to the axis of the vessel,

tremities of the fingers were clubbed. Dyspnœa was marked; the pulse accelerated. The cardiac action was regular and energetic; the impulse below the nipple. On auscultation a coarse, low-pitched, rasping systolic murmur was heard, with greatest intensity at the left third chondro-sternal articulation and at the inner part of the left second intercostal space, in the latter situation seeming more superficial; the murmur was propagated toward the middle of the left clavicle; the second sound of the heart was normal. On palpation a purring tremor could be felt over the area in which the murmur was heard with greatest intensity, particularly at the inner part of the second left interspace. The pulmonary percussion resonance was impaired on the left, below the clavicle, and in the supra-spinous fossa. Subcrepitant and sibilant râles were heard at both apices. There was cough, without expectoration. Several hæmoptyses occurred, following one of which the patient died asphyxiated. At the autopsy the apices of the lungs were found stuffed with tubercles, some of which were caseous; in the left apex were a number of small cavities. The leaflets of the pulmonary valve, which was competent, were replaced by a membrane projecting into the artery like a cone, of which the length was about a third of an inch and the diameter of the free orifice about one-sixth of an inch. The trunk of the vessel, at its middle, was an inch and a half in circumference; its walls thin and soft. The pulmonary artery divided regularly, but there was no trace of a ductus arteriosus. The thickness of the wall of the left ventricle was normal; of the right ventricle and between the ventricles, greatly increased. The tricuspid valve was well developed. The chordæ tendinæ were thickened, the papillary muscles and columnæ carnæ hypertrophied. The right ventricle communicated directly with the aorta, the conus being narrowed and limited in front and behind by two large muscular fasciculi. The interventricular septum was defective at its upper part; the free border was concave. The aorta was situated *à cheval* above the septum. The aortic valve was competent. The aorta was dilated. The right auricle appeared to be thrice as large as the left. The interauricular septum was defective. The duct of Botal was represented by three minute openings. On the septum were numerous bands, giving rise to an areolar appearance. The ductus arteriosus was wanting, but by the side of the aorta was a small cul-de-sac. No other arterial anomaly was discovered.

CHANGES IN THE SPUTUM OF PATIENTS TREATED BY TUBERCULIN.

AMANN (*Centralblatt für Bakteriologie und Parasitenk.*, 1891), of Davos, describes the changes which he has observed in the sputum and in the contained tubercle bacilli of patients with diseases of the lungs treated by injections of the Koch fluid. His statements are based upon examinations of the sputa of 288 patients, 198 of whom received injections. It was found that the quantity of the expectoration and the number of bacilli were, as a rule, increased after reaction had occurred. The appearance of the bacilli was changed. The rods appeared broken up into numerous small fragments. The bacilli stained poorly, apparently from a diminution of their specific resistance to decolorizing agents. In 40 per cent. of the cases injected, reac-

later another attack occurred, which soon terminated fatally. Upon post-mortem examination nothing abnormal was found in the brain. The cavity of the pericardium was distended by an immense clot. At the left border of the left ventricle, a little below the auriculo-ventricular septum, was an ovoid tumor of the size of a small nut, dark in color, with a small opening at its summit, containing a loose clot; but between the cavity of which and the ventricle or a vessel no opening could be found. Above and below were a number of tortuous varicose swellings, none of which communicated with the ventricle. The branch of the coronary artery behind the tumor was normal. The heart itself was in other respects in good condition.

OBSTRUCTION AND INSUFFICIENCY AT THE TRICUSPID, MITRAL, AND AORTIC ORIFICES.

Before the Boston Society for Medical Observation, SHATTUCK (*Boston Med. and Surg. Journal*, 1891) reported the case of a domestic of forty-three, with a history of scarlatina at eleven, of muscular rheumatism at twenty-eight, and of alcoholism. Following the attack of rheumatism there were asthmatoïd seizures. Later on there were bronchitis, dyspnœa, œdema and ascites, derangement of menstruation, icterus, and diarrhœa. The area of cardiac dulness was increased, especially to the right. Over the aortic, mitral, and tricuspid orifices double murmurs were heard. The aortic-systolic was transmitted in the course of the great vessels; the diastolic, downward, along the sternum. The presystolic murmurs heard over the mitral and tricuspid orifices differed in quality. The jugular veins were distended and pulsated. Subsequently the tricuspid-presystolic murmur could not be detected. The area of hepatic dulness, at first increased, became diminished. Systolic retraction became apparent in the region of the apex of the heart. At the autopsy the pericardial cavity was found obliterated by old adhesions. The heart was enlarged; the aortic valve was incompetent; the pulmonary held water. The aortic crescents and the mitral leaflets were thickened, shortened and adherent, and the respective orifices narrowed. The tricuspid leaflets were thickened and shortened, with delicate vegetations at their margins; the orifice was narrowed. Delicate translucent vegetations occupied the pulmonary crescents along the lines of apposition. Two of the segments were adherent. The left ventricle was neither hypertrophied nor dilated; the left auricle was dilated. The right ventricle was hypertrophied; the right auricle dilated. The aorta and pulmonary artery were atheromatous and dilated.

MALFORMATION OF THE HEART AND GREAT VESSELS.

MACAIGNE (*Bulletins de la Soc. Anat. de Paris*, No. 1, 1891) reports the case of a girl of eighteen, in whom, when eighteen months old, a cardiac affection was recognized. She could not participate in the games of children of her age. On the slightest exertion or emotion she became oppressed and cyanotic. For several years there had been cough and occasional hæmoptysis. The face was pallid, livid, puffy; the lips, nostrils, and fingers were cyanotic; the skin was pallid, but not cold; the cellular tissue was relaxed; the ex-

BACTERIUM COLI COMMUNE IN THE PUS FROM A DYSENTERIC ABSCESS OF THE LIVER.

VEILLON and JAYLE (*Compt. rend. hebdom. des Séances de la Soc. Biol.*, 1891) report the case of a patient admitted June 11, 1890, to the Hôpital Lariboisière, with the symptoms of abscess of the liver, having had dysentery in 1881 at Tonkin. From the pus removed by aspiration no cultivable organism could be obtained. Microscopic examination, culture in agar and gelatin of the pus obtained a month later by incision, however, revealed the exclusive presence of the bacterium coli commune. The patient recovered. This observation seems to demonstrate that the bacterium coli commune may invade organs adjacent to the intestine, when these are the seat of disease, without possessing special pathogenetic properties, though perhaps tending to retard recovery.

A NEW TEST FOR ALBUMIN AND OTHER PROTEIDS.

JOHN A. MACWILLIAM (*Brit. Med. Journ.*, No. 1581) states that the reagent is a saturated watery solution of salicyl-sulphonic acid, a white crystalline substance readily soluble in water and alcohol. It precipitates all classes of proteids: 1, native albumins (egg-albumin and serum-albumin); 2, derived albumins (acid-albumin and alkali-albumin); 3, globulins (*e. g.*, serum globulin and myosin); 4, fibrin (whether held in solution by dilute alkalis or by neutral salts); 5, proteoses (albumoses, etc.); 6, peptones.

With all these the reagent at once forms a dense, bulky, white precipitate. This precipitate is not redissolved on boiling, except in the case of an albumose or peptone. The precipitate is readily soluble in a dilute alkali, provided a sufficiency of the alkaline solution be added. It is not soluble in weak acids, nor in strong acids unless a large quantity of strong acid (such as nitric) is added.

The method of testing is as follows: Take a small amount of urine (for example, 20 minims), preferably in a very small test-tube, and add a drop or two of a saturated watery solution of the reagent. If the urine is strongly alkaline an extra drop or two of the acid should be added, and if no opalescence or precipitate occurs it is well to test the reaction with litmus, and make sure that the urine has been made strongly acid. On adding the reagent, shake the tube quickly, so as to mix its contents; then examine at once. The occurrence of an opalescence or cloudiness immediately or within a very few seconds (say two or three) is a test for proteids, intermediate in delicacy between the cold nitric acid test, on the one hand, and the acetic acid and heat test (under favorable circumstances), on the other. The development of an opalescence some time after (for example, one-half to two minutes) is a more delicate test than even acetic acid and heat, and shows the presence of minute traces of proteid, which are probably insignificant from a clinical point of view, as a rule.

Next heat the tube to boiling-point. If the opalescence or precipitate is caused by the ordinary "albumin" commonly present in albuminous urine, it does not disappear on heating; but, on the other hand, becomes markedly flocculent. But if the precipitate or opalescence is due to the presence of

tion was followed by a diminution in the quantity of elastic fibres in the sputum.

ALTERATIONS IN THE BACILLI EXPECTORATED BY PATIENTS.

VIERLING (*Wiener klin. Wochenschrift*, 1891) admits that the bacilli in the sputum exhibit certain changes in form and in behavior toward the aniline stains after injections of the Koch fluid, but denies that these changes are evidences of an alteration in the chemical constitution of the body in general and of the medium in which the bacilli live in particular, and concludes that the changes must be due to purely local causes. He reports a case in a girl, thirteen years of age, which terminated fatally, and in which, during life, alterations in the shape of the bacilli in the sputum were found, while the bacilli in the diarrhœic stools remained unchanged. It would be important to know whether the changes observed were the results of degeneration or of growth.

ANGINA PECTORIS.

R. DOUGLAS POWELL (*Practitioner*, April, 1891, No. 274) argues that angina pectoris is a disturbed innervation of the heart or vessels, associated with more or less intense cardiac distress and pain, and a general prostration of the forces, always producing anxiety and often amounting to a sense of impending death. Considerable stress is laid on habitual high arterial tension as a factor in causation. Angina is not necessarily associated with coronary or other disease of the heart or vessels, although it is true that in fatal cases disease or obstruction of the coronary arteries is the most frequent lesion found, after which in order of frequency come fatty degeneration, aortic dilatation, aortic regurgitation, and aneurism. The author classifies the varieties of the affection as follows:

1. In its purer forms we observe disturbed innervation of the systemic or pulmonary vessels, causing their spasmodic contraction and consequently a sudden extra demand on the propelling power of the heart, violent palpitations, or more or less cramp or paralysis ensuing according to the reserve power and integrity of that organ—angina pectoris vasomotoria.

2. In other cases we have essentially the same mechanism, but with extra demand made upon a *diseased* heart—angina pectoris gravior.

3. The trouble may commence at the heart through irritation or excitation of the cardiac nerves, or from sudden accession of anæmia of cardiac muscle from coronary disease—primary cardiac angina.

4. In certain conditions of blood (often gout), or under certain reflex excitations of the inhibitory nerves, always, however, with a degenerate feeble heart in the background. We may observe intermittence in its action prolonged to syncope—syncopal angina.

Treatment.—In group 1, nitrite of amyl, and still more nitro-glycerin, are of great value, and may require to be combined with nervine tonics or sedatives, iron, zinc, valerian, bromides, etc. In groups 2 and 3, carminative stimulants, or digitalis with nitro-glycerin, are recommended; and of all tonics arsenic, as a rule, is the best.

that relapses occurred as late as two years and six months, and three years and four months, and that, on an average, no method shows immunity from recurrence for a longer period than fifteen months. This warrants the statement that future evidence as to the value of different methods must cover an experience of more than three years, and patients who have been without a recurrence for a year have no reason to expect to remain so permanently.

In one table eight cases are given, presumably operated on for radical cure, since the herniæ were reducible, and the operations were performed in the last five years. Relapse ensued after an average period of twenty-four weeks.

The next table gives twenty cases of irreducible strangulated hernia subjected to operation within eight years, without any data as to method. A radical cure may or may not have been attempted. Relapse occurred, on an average, in eighteen months.

These cases certainly demonstrate that many methods are defective and likely to prove disappointing if observed for a sufficient length of time.

Since ten years have elapsed since the modern operations have been in vogue there should be patients who have been more than five years without relapse. Some such patients could naturally be expected to appear at hospitals; no such records are present.

In the hospital books are recorded 46 patients who have been subjected to radical operations, and who present no sign of relapse, and who have been furnished with trusses; of these, only 5 have been under observation for three years, 8 for less than two years, and 32 for less than one year.

In a series of 136 radical cure operations reported by the author a year ago, there were only 4 cases that had been over four years without recurrence.

Eighteen cases are tabulated which were operated on for irreducible strangulated hernia, and in which no attempt at radical cure was made. This latter fact was ascertained from the date of operation (prior to the introduction of modern methods), or was known from the statement of the operator. The patients averaged 45 years. The period at which the relapse occurred varied from one month to 23 years, and was on an average 5 years. It is noteworthy that of 15 of these cases all wore trusses from the time of operation.

The author is not prepared to offer any statistical data bearing on the question of trusses preventing relapse or prolonging a cure. He states in general that the largest and most voluminous protrusions were met with in patients who had worn no truss; and furthermore, he had never seen any evidence of damage to structure by the pressure of the truss. In his own practice he always has his patients fitted with a truss immediately after the wound has healed, and directs that the pressure shall be very slight—that is, shall merely support the parts. Much that has been said against trusses can be laid to the score of the operation, and the condition that the parts are left in by it rather than to the truss. If suppuration is prolonged in the wound, and it is compelled to heal by granulation, a cicatrix of less vitality and less elasticity than the normal skin and subcutaneous fat is left. This structure is not tolerant of pressure. A primary union which restores the parts as nearly as possible to their normal condition will not be unfavorably affected by the truss. On the other hand, in a wound with much cicatricial tissue there is

albumoses or peptones, it clears up on heating (before the boiling-point is reached) and reappears when the tube cools.

The author is satisfied from careful experiments, that—1, the precipitate is really a proteid one; 2, that it is always obtained when proteid is present in the various abnormal conditions of urine which may have to be examined; 3, that the precipitate cannot be caused by any other non-proteid constituent of the urine. Cloudy phosphatic urine clears adding the reagent.

Urine containing excess of urates gives no precipitate, nor does proteid-free bilious urine. As regards the presence of a large quantity of mucin this is not likely to prove a source of error. Moreover, it is probably only in the case of alkaline urine, when there is at the same time a marked irritation of some part of the urinary passages, yielding a greatly increased mucous secretion, that the amount of mucin in the urine can be sufficient to come into question at all. But in such conditions of the urinary tract the detection of a trace of albumin is probably of no significance. Normal urine gives no reaction with salicyl-sulphonic acid.

SURGERY.

UNDER THE CHARGE OF

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RELAPSE OF HERNIA AFTER VARIOUS OPERATIONS FOR RADICAL CURE.

Since BULL has had a more extensive experience with the radical cure of hernia than any other surgeon of this country his utterances upon this subject bear great weight. During the past three years, aided by his assistant, DR. S. E. MILLIKEN (*New York Medical Journal*, vol. liii., No. 22), he has carefully examined the histories of patients applying to the Hospital for Ruptured and Crippled in the hope of furnishing some statistical evidence of the value of different methods of radical cure of hernia. The tabulation made of relapsed cases numbers 119. In 73 cases the method of operation was definitely ascertained.

The average age in all the methods was about the same—from thirty-eight to forty-four years—showing that the extremes of life generally have been avoided. The duration of treatment, practically wound healing, in Czerny's method, where the pillars of the external ring and the integuments are carefully sutured, is almost as great as in the open method. This is an argument in favor of allowing the wound to granulate. It is particularly noteworthy

however, bear a constant relation to the artery. At times, even though the muscle is displaced to the side, the artery lies near the middle line.

Variations in the origin of the epigastric artery seem to have no influence on the course of the former vessel.

The artery is usually accompanied by a single vein.

Paracentesis abdominis should be performed either in the linea alba or in the outer half of the line joining the umbilicus and anterior superior iliac spine. In case the linea alba is selected, it is not important to keep strictly in the middle line, since there is an arterial branch which may be wounded if the trocar is entered, even slightly, to one side.

CATGUT INFECTION IN THE DRY TREATMENT OF WOUNDS.

KLEMM (*Archiv für klin. Chirur.*, Bd. xli., Heft. 4), on adopting the dry treatment of wounds, employed catgut as the material for placing buried sutures, and was surprised to observe as a result that abscesses developed at the site of operation much more frequently than was the case when he employed silk alone as suture and ligature material. At first this was attributed to some carelessness in operative technique, but even after the minutest observance of every precaution suppuration still occurred. For the first few days after operation there was no fever, no local pain or tenderness. On the sixth day, when the silk sutures were removed (the wounds were not drained), there seemed to be healing without disturbance by microorganisms. On the eighth or tenth day there was an elevation of temperature and swelling and tenderness in the region of the wound. On tearing open the latter an abscess was found, which, without exception, was found in the deeper part of the incision, where the catgut had been placed. The catgut employed was prepared by repeated washings in five per cent. alcohol-sublimate solutions until the latter showed no turbidity. The catgut was then stored in absolute alcohol, from which it was not taken until it was needed for use.

To determine whether this method of preparation rendered the gut sterile, a great many culture experiments were carried out. They all showed that the catgut thus treated was germ-free. Klemm next implanted in the deep tissues of dogs catgut prepared as first described and portions of sterilized silk of corresponding sizes. Examination some days later showed septic inflammation about the catgut implantations, whilst the tissues about the silk were in a normal condition. Culture of the catgut showed countless colonies of microorganisms. In the silk there were either none or very few.

From these experiments it is evident that catgut can be surely sterilized, but that, even though itself germ-free, it greatly favors infection of wounds. This infection, of course, takes place during operation, since it is almost impossible to keep a wound absolutely germ-free. The few germs which thus gain access find a favorable medium in which to grow in the softening, non-resistant catgut.

BOTTINI'S METHOD OF TREATING THE ENLARGED PROSTATE.

MORROTTI (*British Medical Journal*, 1891, No. 1586) describes Bottini's method of treating enlarged prostate by means of the galvano-cautery. This method is designed to remove or lessen the mechanical obstruction to the

a natural tendency to softening and yielding, and this tendency should be hastened by the pressure of the truss without and the viscera within.

In cases treated by the open method the orifice of the relapsed hernia is not unlike that of ventral herniæ—that is, an opening in the wall without any canal, so that the hernia protrudes directly forward. This condition makes greater difficulty in the adaptation of a truss, which is further enhanced by the thinness of the yielding cicatrix. Although at first the cicatrix of the open operation can be recognized by its depressed situation and firm, contractile, tense character, at a later period it begins to yield in places or all along its line, and ultimately presents the features just mentioned.

Although these patients are not cured, the majority are certainly improved. They find much satisfaction in the fact that the protrusions are not so large as before operation; they experience increased comfort and security in the wearing of a truss. The author states that the figures given do not afford any valuable evidence as to the comparative reliability of different methods, but only emphasize the lack of promise to effect a cure. He believes that it is still wise to continue to strive for better methods. He advises that the term cure should be dropped, and the value of given procedures should be estimated by the relative proportion of relapses. That plan will be judged best which shows the smallest number of relapses in the course of the longest period of observation; such period should be at least five years. He further believes that all procedures should be so devised as to insure prompt healing of the wound, and that the support of a truss should be insisted on from the time the patient leaves his bed.

THE SEAT OF PUNCTURE IN PARACENTESIS ABDOMINIS.

TRZEBICKY (*Archiv für klin. Chirur.*, Bd. xli., Heft 4), in performing paracentesis abdominis at the point of election—that is, midway between the umbilicus and the anterior superior spine of the ilium—wounded a large bloodvessel which gave such troublesome bleeding that the life of the patient was threatened. The hemorrhage was arrested by compression of the common iliac artery. Incited by this experience, and by several reports of fatal bleeding following puncture at this point, Trzebicky conducted an experimental research upon a large number of cadavers. As a result of this he announces the following conclusions:

In the majority of cases paracentesis performed at a point midway between the umbilicus and the anterior superior spinous process of the ilium is perfectly safe, since neither the epigastric artery nor any large branch of this vessel is liable to be wounded. The artery commonly crosses this line at the junction of the inner with the middle third.

In a certain proportion of cases, however, the epigastric artery or one of its branches lies directly beneath the point of election.

The course of the epigastric artery is seldom exactly similar in the two sides of the body.

Since the artery runs within the sheath of the rectus muscle, its course depends mainly upon the position of this muscle. In case the two recti are separated by abdominal distention, the artery is displaced so that it lies very near the point of election for puncture. The rectus muscle does not,

cially is this the case when there is contraction of some part of the passage. The blood being mingled with a large quantity of water is not noticed at first. As the volume of the stream of urine diminishes it becomes more distinctly colored, till finally pure blood drops from the meatus. This form of hemorrhage must be diagnosed from that which originates in the bladder, as the latter is often of serious diagnostic import. The urethral hemorrhage is attended with burning, but is not marked by the straining and sensation of something that is left in the bladder which marks inflammation or disease of the latter organ.

OTOLOGY.

UNDER THE CHARGE OF

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THE AFFECTIONS OF THE EAR IN TABES DORSALIS.

DR. LEOPOLD TREITEL, of Berlin, has made a careful examination of the ears in a number of tabetic cases, and his conclusions are as follows (*Archives of Otolology*, vol. xix.): In five cases of tabes, where the hearing was affected, only two the author considers as probably due to an affection of the auditory nerve. Careful study leads him to the conclusion that not only the perceptive apparatus of the ear, but also the conducting apparatus is affected. In one case, at least, there was reason to believe that changes had occurred in the mucous membrane of the tympanic cavity, "which depend on a retrograde metamorphosis, and may also be called sclerosis."

The author concludes that particular trophic fibres of the fifth nerve must be diseased, which may be affected alone, or together with sensory fibres. In one case trophic changes in the tract of the fifth nerve and the glosso-pharyngeal nerve were observed—two nerves which send branches to the tympanic cavity. From numerous observations Treitel is inclined to believe that "sclerosis of the posterior columns of the cord not rarely causes trophic changes in the middle ear, which may lead to disturbances of hearing." Such changes might be found frequently, if looked for, at necropsies. A number of facts seem to indicate the development of sclerotic changes in the middle ear from a tabetic cause.

It is fair to suppose that the aural affection is due to the tabetic disease, "when the disturbance in hearing is first noticed after the undoubted beginning of the tabes, no aural disease having previously existed, provided that the otological examination corresponds to the clinical history." The author cannot confirm the statement of Gradenigo,¹ "that especially in cerebro-

¹ THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES, Nov. 1890, and *Archives of Othrhenn.* vol. xxx., 1890.

outflow of the urine. To accomplish this a special instrument has been devised. This consists of an incisor apparatus and a battery. The former is a catheter-shaped metal tube, the lumen of which is divided into four separate compartments; two of these are for the conducting of electric wires, the other two are channels for the passage of a stream of cold water, which runs to the distal extremity of the instrument, thus preventing it from becoming over-heated. The conducting wires end in a cautery knife, which, when heated to a dull red, is applied to the hypertrophied tissue. This knife can be screwed backward and forward, and can be completely shielded by the curved point of the instrument.

In performing the operation the patient's urethra should be habituated to the use of the instrument before cauterization is attempted. Anæsthesia is not always necessary. Water need not be injected into the bladder unless this viscus is quite empty. The patient is placed in the lithotomy position and the instrument is used in the usual way. When the point is in the bladder it is turned downward, and is then drawn forward so as to cause the beak to hitch against the prostate and bring the cautery into contact with the part upon which it is desired to act. By exposing the knife, connecting the current, and gently elevating the handle of the instrument, the point is made to burn its way slowly through the prostate. When the sound of burning is heard the point should be moved backward and forward until the projecting lobe is completely divided. The knife should be allowed to cool; should be returned to its sheath; the instrument should then be passed into the bladder, and should finally be withdrawn.

Bottini has operated in this manner in 57 cases, with 3 deaths. In 32 cases a perfect cure was effected, in 11 there was improvement, and in 12 the result was *nil*. If the hypertrophy is only moderate the obstructing lobe should be entirely destroyed. In advanced cases the surgeon should be content with tunnelling a passage. Both these procedures are contra-indicated if kidney disease is present.

RUPTURE OF THE URETHRA FROM DISTENTION.

BAZY (*La Semaine Méd.*, 11 Ann., No. 14) has conducted a number of experiments to determine which portion of the urethra is most prone to rupture when this canal is forcibly distended. In the great majority of cases the urethra gave way at its bulbous portion, though in a certain proportion of cases the tear involved both the bulbous and membranous urethra. In the latter case the resulting effusion was poured into the rectum. In the exceptional cases, when the membranous urethra alone was involved, the extravasation was, of course, found in the space of Retzius. The ruptures were always on the floor of the urethra, or on its lateral walls. From this it follows that in case of tight stricture, even though the lesion is located in the penile portion of the urethra, if rupture takes place this is commonly located at the bulb.

In this relation the author again calls attention to the fact that terminal bleeding, that is hemorrhage following urination does not necessarily originate from the bladder, or from the neck of the viscus. Slight rupture of the anterior urethra may readily occur from the impact of the urine; espe-

moldal transformation of the mucous membranc of the middle ear," but this idea is "annihilated by the very localization of these tumors," which, up to this time, he has never found actually within the tympanic cavity itself. Bezold maintains that epidermic cells gain access both to the atrium and the attic of the tympanum, and thence into the antrum and the mastoid cells, from the external auditory canal through perforations in the membrana tympani.

"The moment that the sharp distinction between the cutis and the mucous membrane has once been lost by destruction of the surface of the membrana at any spot, we see the cutis of the remaining intact region gain the ascendancy over the mucous membrane, and extend with much greater rapidity over the entire district." Thus, when the membrane is entirely broken down, an epidermic layer from the skin of the external auditory canal may extend even into the mastoid cells (Schwartz). It appears that a favorite port of entrance of epidermic cells into the attic is through perforations in the flaccid membrane, above the short process.

Bezold then considers the origin of attic suppurations and perforations in the flaccid membrane.

It has always been difficult to say how suppuration in the attic, with perforation in the membrana flaccida only, originates. It was once supposed to come about like suppuration of the atrium of the tympanum, viz., through the Eustachian tube. But this has always been far from certain. Bezold rejects this latter theory, as does Walb (*Archiv. f. Ohrenh.*, vol. xx. p. 185, etc.), and he believes, with Walb, that purulent infection of this attic space in the tympanic cavity enters from the *external meatus, partly in the form of an otitis externa, with ulceration at the margin of Shrapnell's membrane*, and partly through a persistent foramen Rivini. This theory is strengthened by the fact that we often find evidences of closure of the Eustachian tube in cases of chronic purulency of the attic with perforation of the flaccid membrane.

Treatment.—It is maintained by the author that occasionally spontaneous cures occur in these cases. The surgeon's task, it is claimed, is either to enlarge the orifice into the attic by removing the upper bony margin of the perforations in the meatus, or by extraction of the malleus and anvil, or, thirdly, by making a new opening into the antrum. Entire removal of the epidermic (neoplastic) lining of the drum cavity is impossible.

TOPOGRAPHY OF THE NORMAL HUMAN TYMPANUM.

At the suggestion of Professor Blake, of Harvard Medical School, Dr. WILLIAM S. BRYANT, of Boston, has examined a number of temporal bones with special reference to the reduplications of the mucous membranc lining the tympanic cavity. Not one of the tympana examined—over one hundred—was free from these folds, and in several instances they occupied the whole cavity of the tympanum above the ossicles.

These folds are arranged by Dr. Bryant in three groups: 1. Those of the mastoid antrum, in which there is usually a central longitudinal band, with radiating lines and trabeculae. 2. Those attached to the malleus and incus radiating from the three long axes of the bones. 3. Those of the stapes and round window, and the neighboring tympanic wall. "The mucous folds

spinal diseases with amblyopia or amaurosis, an (electric) excitability of the auditory nerve is found."

So-called paradoxical conditions of hearing in deafness from tabetic or central causes, "where a screaming voice is heard only very near the ear, and the sound of the words, without the detail of the articulation, is still perceived, and even the scratching of a pen, the striking together of two metal pieces, etc.," are not admitted to exist in deafness from central causes alone, as they are often found in deafness from other causes, as, for instance, in sclerosis. In two patients with marked lessening of pain- and touch-perception on one side, no difference was found in the sound-perceptions of the two sides. "Whether for the production of this condition a lessening of all the sensibilities is required is very questionable."

Chataigner's¹ conclusions are thus quoted: "The disturbances on the part of the ear (in tabes) may be of varying intensity. They are caused by a hyperæmia of the labyrinth, which may depend on a direct irritation of the auditory nerves, which extends from the centre toward the periphery, or of other nerves which exercise a vasomotor influence on the vascular system of the ear." The deafness in the former case may be total, in the latter partial. The disturbances in hearing may be the first symptom of the tabes." This view as to vasomotor influences leading to trophic changes in the middle ear harmonizes with that of Treitel.

NOTEWORTHY CHANGES IN THE NASAL MUCOUS MEMBRANE IN A CASE OF LEUKÆMIA.

SUCHANNEK, of Zürich, has examined post-mortem the nasal mucous membrane in leukæmia. The mucosa of both the respiratory and of the olfactory portion showed color entirely different from the normal one. Usually the respiratory portion is pinkish, in the olfactory region yellowish intermixed with pink. The leukæmic membrane, however, had a moist, glistening appearance, and possessed throughout its inferior part, up to the middle turbinated bone, a light yellowish-brown; the upper portion, including the olfactory fissure, the superior turbinated bone, the part below the ethmoidal plate, the corresponding portions of the septum, a *dark-brown color*. The mucous membrane was also decidedly thickened throughout its whole extent. Microscopic sections showed lymphomatous nodules in the turbinated bodies, on the septum, and especially in the nasal roof. Normal olfactory epithelium was found—accompanied, however, by a total destruction of the glandular apparatus.—*Archives of Otolaryngology*, vol. xix.

CHOLESTEATOMA, PERFORATION OF SHRAPNELL'S MEMBRANE, AND OCCLUSION OF THE TUBES: AN ETIOLOGICAL STUDY.

BEZOLD, of Munich (*Archives of Otolaryngology*, vol. xix.), under the above title contributes one of the most instructive and interesting papers it has been our good fortune to read. It has long been a question how concentric epidermic masses originate in the attic, antrum, and mastoid region. Virchow has thought that cholesteatoma might originate at these points by "an epider-

¹ Thèse de Paris, 1890.

articulation and tenotomy of the stapedius through an opening in the posterior portion of the membrana tympani sufficiently large to permit ready access to the stapes and round window."

HEMORRHAGE INTO THE LABYRINTH, IN CONSEQUENCE OF ORDINARY ANÆMIA.

The same observer records also a case of the above-named character (*Ibid.*). This case was examined only during life. A young woman, twenty years old; four years previously had suffered from anæmia, with hemorrhages into the stomach, intestinal canal, and retina. At the same time the hearing, previously perfect, became affected without any known cause, and also there ensued tinnitus aurium and vertigo. The anæmia gradually disappeared, the eyesight was restored, and the hearing became better, but not perfect. The vertigo and tinnitus aurium also ceased. Examination lately by Dr. Habermann revealed nothing abnormal in the membrana tympani nor in the naso-pharynx. It was concluded that at the time of the hemorrhages into the stomach, intestinal canal, and retina, there also occurred a hemorrhage into the labyrinth.

DERMATOLOGY.

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TREATMENT OF ANTHRAX BY CARBOLIC ACID.

POTEENKO (*The Practitioner*, 1890), praises the treatment of this disease by the parenchymatous injections of a ten per cent. solution of carbolic acid. Four severe cases were successfully treated, three or four Pravaz syringefuls of the solution being injected, once daily, into the swelling and surrounding tissues. The parts were kept covered with a dressing soaked in a five per cent. solution of the same remedy. A few days sufficed for the relief of the fever and other symptoms of systemic infection.

ARISTOL AND ITS USES.

EGASSE (*Bull. gén. de Thérap.*, 1890) thinks that its value in lupus has been overestimated. Neisser claims that it is not antiseptic. Observers are generally agreed that as an application to wounds it may well replace iodoform. It is especially useful in simple and varicose ulcers. In psoriasis its action

about the stapes join the crura together or connect the stapes with the walls of the pelvis ovalis. The mucous folds which are attached to the ossicula perform essentially the function of the ligaments, binding them together, or to the walls of the tympanum; and for this reason they might be classified as ligaments."

The article is accompanied by fifteen colored engravings, showing very graphically the results of Dr. Bryant's great industry in the study of these important structures in the drum cavity.—*Archives of Otology*, vol. xix.

REDUPLICATIONS OF TYMPANIC MUCOUS MEMBRANE.

Under this title DR. CLARENCE J. BLAKE, of Boston, draws attention to a series of important pathological conditions in the middle ear, and the results of their formation, upon the hearing (*Archives of Otology*, vol. xix. p. 213). As an important factor in the persistence of chronic suppurative disease of the middle ear, and also in the effects which that and various other non-suppurative diseases have upon hearing, Dr. Blake considers certain folds, bands, or reduplications of mucous membrane in the upper and posterior part of the drum cavity. These impair the mobility of the chain of ossicles, and of its complement, the membrane of the round window. These folds are divided into, first, a horizontal set, which impair drainage from the attic, and a vertical set, which are disposed around the stapes and the round window. This second class is important, because they interfere with the mobility of these essential parts of the conducting apparatus of the ear. A third set is described as striæ or reduplications, chiefly the former, in the neighborhood of the mastoid antrum. The two first are considered of most clinical importance. They exist normally in about 70 per cent. of all human ears, and are not to be considered pathological in themselves. Aside from an obstruction to drainage from the attic, the first class of reduplications "may be considered as playing an important rôle in the etiology of those diseases of the tympanic attic the majority of which start with a suspension of vasomotor inhibition in that region."

When a suppuration has been established, the presence of the mucous folds of the first class—the horizontal ones—may become an interference to free movement on the part of the ossicles after the suppurative process has closed.

The thickening and adhesions of the folds of the second class, viz., those about the stapes and neighborhood of the round window, interfere with the motility of these important parts. In cases where the membrana tympani is largely perforated, with spontaneous evulsion of the ineus, "the considerable impairment of hearing, due to the immobility of the stapes from the adhesions and thickening of their mucous folds, an immobilizing effect still further increased by the unrestricted action of the stapedius muscle, has been improved by the division, first of the tendon of the stapedius, and then of these folds."

Dr. Blake thinks that in any case of chronic non-suppurative disease of the middle ear the operation of excision of the membrana tympani and evulsion of the malleus and ineus is not necessary until other means are tried, as the stapes can be freed in some cases "by a division of the ineudo-stapedial

also accounts for the success of many well-established methods of treatment which aim at changing the channels of elimination.

SCARIFICATION IN KELOID AND HYPERTROPHIC CICATRIX.

VIDAL (*Annales de Derm. et de Syph.*, No. 3, 1890) states that not only the keloid, but also the cicatrices made by the scarifications for the cure of the keloid disappear. The treatment of large tumors lasts for several months, while for recent growths six or seven operations may suffice. The scarifications must be continued until the cicatrix is supple and thin, and until all signs of induration have disappeared, otherwise the growth will re-form. The scarifications should be made at a distance of two millimetres, be cross-hatched at a right angle or obliquely, square or lozenge-shaped, and should penetrate through the depth of the keloid and not extend more than two or three millimetres beyond the margin of the growth. Local anæsthesia, produced by the application of liquefied chloride of methyl, is employed, the part being painted until whitened by freezing. As soon as the natural color inclines to reappear, a second, or even a third application should be made. By these successive applications the anæsthesia penetrates more deeply, and the scarifications cause only a very moderate degree of pain. The loss of blood is not much, being controlled by absorbent cotton. On the first day this is steeped in a solution of boric acid, and the next day the growth is dressed with a piece of *emplastrum de Vigo*, and renewed twice daily. The action of the mercurial has been found favorable by the author.

THE TREATMENT OF RODENT ULCER WITH RESORCIN PLASTER-MULL.

BOECK records briefly (*Monatshefte für praktische Dermatologie*, Bd. xii., No. 4) two cases of rodent ulcer treated successfully with the plaster-mull of resorcin (Unna's formula). In the one case, a man aged seventy-two years, the lesion consisted of an ulceration of one and a half inches in diameter, situated on the cheek; in the other case, a patient aged eighty-two years, the ulcer was seated upon the temporal region. The plaster was kept constantly applied, a fresh application being made daily. Favorable change was to be noted from day to day, the time required for a satisfactory result varying from two to several weeks.

PEDICULOSIS PUBIS.

In a clinical lecture (*L'Union Médicale*, February 26, 1891) on pediculosis pubis, FOURNIER very properly decries the treatment of this condition with blue ointment, inasmuch as this method is not only dirty and otherwise offensive, but it commonly gives rise to the so-called eczema mercuriale, and may also, through absorption, bring about moderate or severe pyæmia. Much preferable and equally efficacious are—an ointment of calomel, 1 to 20; baths of corrosive sublimate; a lotion consisting of 400 parts of water, 100 parts of alcohol, and 1 part of corrosive sublimate; and one consisting of 300 parts of vinegar and 1 part of corrosive sublimate, to be applied diluted with one or two parts of water. As to the removal of the ova, the same method is to be

is said to be as certain as chrysarobin, than which it acts slower and produces no irritation, and not much staining of the skin or clothing. It may be employed as a ten per cent. flexible collodion or ointment.

TRAUMATIC HERPES ZOSTER.

JANIN (*Brit. Med. Journ.*, vol. ii. p. 527, 1890) reports a case of this disease in a healthy boy aged fourteen years, which originated in a painful prick of a thorn in the shoulder. The puncture healed, but the site remained painful, the pain gradually spreading over the whole side of the back and chest. Eight days after the accident an exceedingly painful attack of herpes zoster appeared, occupying the third, fourth, and fifth intercostal spaces, and extending from the vertebral column to the sternum.

THIOL IN SKIN DISEASES, ESPECIALLY DERMATITIS HERPETIFORMIS.

SCHWIMMER (*Wiener klin. Wochenschr.*, 18, 1890) recommends thiol in the treatment of erythema, dermatitis herpetiformis, herpes zoster, acne rosacea, acne, papular and moist eczema, and burns; used generally in an aqueous solution 1 to 3. It proved especially useful in a case of dermatitis herpetiformis which had resisted other remedies. In erythema multiforme the remedy in powder form seemed preferable. The liquid form was best adapted to papular eczema. It is said that there is no unpleasant odor.

TREATMENT OF URTICARIA BY IODIDE OF POTASSIUM.

STERN (*La Semaine Médicale*, 1890) has treated five cases successfully, four of them being more or less chronic and rebellious to all previous treatment. None of the patients were either syphilitic or asthmatic. In one case, of four months' duration, the itching disappeared on the second day of treatment, and the cure was completed after two and a half drachms of the remedy had been taken. In two cases (one acute, the other chronic) the itching was at first increased, but a successful result was obtained in each case after the administration of seventy-five grains of the drug.

DERMATITIS AS AN EXCRETIONARY SYMPTOM.

WALSH (*Medical Press and Circular*, 1890) considers this subject and endeavors to show that excretory irritation is a not uncommon factor in inflammations of the skin. The conclusions arrived at are that—(1) Dermatitis may be set up in a certain number of cases by the excretion of irritant products from the system. (2) The irritant may be chemical or due to micro-organisms. (3) That many of the inflammations of the hypo- as well as of the epiblastic tissues are simply expressions of excretory irritation. (4) That the severity of the inflammation and its result is in proportion to the specific action of the irritant on excretory epithelium. (5) That excretory parallels may be drawn between drugs and specific disease poisons, both as regards their harmfulness to epithelium and their channels of elimination. (6) Excretion not only affords a key to a certain number of skin inflammations, but

Under topical treatment these conditions subsided almost entirely during the course of the year. In October, 1885, a corneous granulation was noted for a while in the anterior third of the left vocal band, but it soon disappeared. February 2, 1886, only infiltration of the left ventricular band and paresis of the left abductor muscle were to be noted. November 13th, the left vocal band was so much hidden as to appear only as a projection the thickness of a catgut ligature. Eight months later, July 13, 1887, the voice was completely hoarse. There was a smooth infiltration of the left ventricular band fully over-covering the vocal band. At this time the diagnosis of sarcoma was made. December 13th, the infiltration was greater, and covered the orifice of the ventricle as well as the vocal cord; the left ary-epiglottic fold was somewhat infiltrated and looked œdematous. A month or so later, June 29, 1888, the infiltration had extended forward and had crossed the anterior commissure of the glottis to the opposite side, and the left side of the epiglottis appeared somewhat thickened and turned toward the right. The movements of the left half of the larynx were somewhat more sluggish than those of the right side. The patient complained of a sense of tension in the entire throat, and of difficulty in deglutition. Unilateral exsection of the larynx was now advised but refused. In September the vocal band had become visible and was exulcerated anteriorly and posteriorly, and a uvula-like tumor had become developed at the base of the epiglottis toward the right side. In October there was some bloody expectoration; some fœtor from the mouth; glutition of food was off-and-on painful; and the tumor at the anterior commissure had enlarged. The left arytenoid region seemed somewhat excoriated through the pressure of the tumor. The pus seemed to escape from an abscess cavity beneath the left vocal cord. Pressure over the left thyroid cartilage elicited lancinating pains extending toward the ear.

On November 8th, after performing a preliminary tracheotomy, and occluding the trachea, Dr. Hahn, of Berlin, split the larynx and found the region of the ventricular and vocal band of the left side transformed into a whitish-gray tumor composed of a smaller portion anteriorly in the median line and coalescent with a larger mass in the centre of the left side. The growth was not eroded and appeared to be fully circumscribed. It was removed by incision into the surrounding healthy tissue one-half to one centimetre from its borders, and the lower portion of the thyroid cartilage was also excised after separation of the external soft tissues with a respirator. The wound of incision and the cavity of the larynx were firmly tamponed with iodoformed gauze which was secured with sutures through the integuments.

The patient did well for about a year. Then recurrence took place, and fifteen months after the excision, the new growth presented much the appearance of the first one at the period of the operation, and was rather more extensive.

June 6, 1890, a low tracheotomy became necessary; and the patient at last report was wearing a large-sized canula with comfort, with great improvement in respiration and with improvement in speech, but deglutition was very little bettered, inasmuch as the growth had extended into the left glosso-epiglottic fold.

practised as in pediculosis capitis—that is, with washings of warm vinegar, slightly diluted, and subsequent combings.

LEPRA AT HANOI (TONQUIN).

BOINET (*Revue de Médecine, Medical Chronicle*, 1890) finds that the disease exists along the watercourses, and that mud is a probable carrier of infection to the naked feet of the poor, the earth being impregnated by the sputa, crusts, and discharges from the lepers. The soil of the cemetery of Hanoi was found to be highly charged with the bacilli, the mode of burial being extremely careless. Native physicians scarcely acknowledge heredity. In the eighty cases examined, absence of heredity was found in sixty-one. The chiefs of the villages, forty years resident, deny having seen any case directly transmitted; nor are they themselves afflicted. Healthy young girls marry lepers and fail to contract the disease. A case is given in which grandfather and grandmother are lepers, while the father and five children, who have constantly lived in the community, have escaped. The eighty cases establish the *possibility* of direct contagion in fifty-one. Children of lepers removed soon after birth to an unaffected district remain free from the disease, while their brothers and sisters living in the leper community contract it. Such children, returning in adult life to the community from which they sprang, presently develop symptoms. The theory of the infection by means of the mosquito is regarded as being by no means impossible. The bacillus can find entrance into the mosquito, and has been found in human blood.

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

UNDER THE CHARGE OF
J. SOLIS-COHEN, M.D.,
OF PHILADELPHIA.

CARCINOMA OF THE LARYNX.

The clinical history of a carcinoma of the larynx is well exemplified in the record of a case under the care of DR. MAX SCHAEFFER, of Bremen (*Deut. med. Wöch.*, No. 28, 1890). A man, fifty years of age, several of whose immediate relatives had perished with carcinoma, had suffered with psoriasis for twenty-eight years, with laryngo-tracheal catarrh for twenty-five years, and with hoarseness and soreness in the left half of the larynx for ten years. At the end of these periods, June 3, 1885, he was still well nourished and in good general health. His larynx showed slight infiltration and paresis of the left vocal band, with infiltration of both ventricular bands and of the left aryepiglottic fold. His respiration was somewhat weaker on the left side than on the right.

was no emphysema and no dysphagia. The larynx was flattened and deviated to the left side. Pressure over the thyroid cartilage provoked pain on the right side. Laryngoscopy revealed hyperæmia of the epiglottis, aryteno-epiglottic folds, and the entire superior portion of the larynx, with infiltration more marked on the right side, and infiltration of the vocal bands and the arytenoid region. Tracheotomy was performed. The deep fascia had barely been incised when air escaped, denoting the existence of a fracture. The trachea was found flattened, with lateral fracture of three or four of the upper rings. The moment the canula was introduced sudden emphysema of the neck and face ensued, which gradually extended to the arms and trunk, in consequence of the frequent expulsion of the canula, which was too short. A special canula was introduced the day following, and the emphysema disappeared completely the eighth day.

Dr. Desvernine saw the patient for the first time late in 1887, when he was suffering with advanced pulmonary tuberculosis. The canula had been dispensed with for three or four years, and he breathed through a permanent infundibular fistule barely five millimetres in its exterior diameter. He spoke with effort in a bass monotone extremely limited in modulation.

The entire peri-laryngeal and laryngeal regions were normal, except that the vocal bands were completely in adhesion save for a minute orifice at their thyroïdal extremities. The free borders of the ventricular bands formed an ellipse, the borders of which became approximated in phonation by a movement of elevation upon an accentuated convex plane. This phonatory function of the vocal bands had been observed at intervals during the long period of seventeen years. Operative interference to separate the vocal bands was declined. The patient died in 1888.

The autopsy disclosed that there had been a fracture of the thyroid and cricoid cartilages and of the upper four rings of the trachea; the solution of continuity of the cartilages having been complete. This explained the inability of retaining the short canula at the tracheotomy, the incision of which, parallel to the line of fracture, had partially liberated a band of elastic tracheal tissue three millimetres in length, which acted as a lever to drive the canula outward.

The ventricular bands had undergone development to double their ordinary thickness, their muscular fibres, as well as those of the aryepiglottic folds, being the seat of a most accentuated hypernutrition. The crico-arytenoid articulations were solidly ankylosed. The muscular fibres concerned in abduction and adduction of the vocal bands, as well as those concerned in their transverse and longitudinal tension, were in an evident state of atrophic regression, without presenting any characteristics of neuro-genetic atrophy.

SPASMODIC TIC OF THE SOFT PALATE.

At a recent meeting of the Société Médicale des Hôpitaux (*Le Mercredi Médical*, 1890) M. DIEULAFOY presented a subordinate officer, forty-two years of age, and in perfect health, who had for two years an extremely marked spasmodic tic of the soft palate almost isochronous with the beats of the pulse. The only complaint was that of a certain amount of constraint produced by the spasm.

The chief point of interest in this case is the slow development of the carcinoma, which for a long time obscured the diagnosis.

FRACTURES OF THE LARYNX AND TRACHEA.

At the time the compiler prepared the article on this subject for the *International Encyclopædia of Surgery*, but two cases of recovery after fracture of the cricoid cartilage appeared to be on record; the cases of Treulich and of Masucci. Two additional instances have recently been recorded. One occurred under the observation of DR. ALFRED SOKOŁOWSKI, of Warsaw, which is reported (*Berl. klin. Woch.*, 1890) with many interesting details, especially in reference to its laryngoscopic phases.

A country girl, twenty years of age, wearing an apron over her shoulder and tied in a knot around her throat, after the fashion of the country, got the apron caught in the driving-wheel of a hay-cutter. Pain in the laryngeal region and dyspnoea were immediate, and were soon followed by severe cough, which continued for several hours, and was attended with expectoration in which was a good deal of blood. On the following day Dr. Sokołowski and his colleague Bukowski found her with cyanotic and œdematous visage, severe dyspnoea with respiration interrupted by severe stridulous cough, hoarse voice, and speaking with difficulty in a barely recognizable whisper. Considerable purulent sputum was expectorated with the cough. The entire neck was greatly swollen, and subcutaneous crepitation was felt in every portion on palpation. A deep vertical depression was felt in the left thyroid cartilage, pressure upon which produced pain and decided sensations of crepitus. Laryngoscopic inspection revealed a moderately swollen and congested epiglottis, beneath which two thick reddened projections were seen corresponding to the upper borders of the thyroid cartilage and occluding the interior of the larynx. Tracheotomy was at once performed by Bukowski. A perforation into the interior of the larynx was found occupying the lower angle of the thyroid cartilage, and due to comminuted fracture of the thyroid cartilage and of the anterior portion of the cricoid cartilage. This opening needed but slight enlargement downward to permit a large canula to be readily inserted through it. Two small fragments of cartilage became detached during the operation. Although recovery ensued, the patient has been unable to dispense with the canula. On performing laryngo-fissure to determine the cause of stricture, it was found that the entire cricoid cartilage had disappeared, and that what appeared in the laryngoscopic image to be the posterior wall of the larynx was in reality the anterior wall of the lower portion of the pharynx.

DR. C. M. DESVERGINE-GALDOS, of Havana (*Rev. de Ciencias Médicas and Annales des Mal. de l'Or., du Lar.*, etc., 1880), reports a case of laryngo-tracheal fracture, survived for several years, in which the vocal bands became united almost their entire length, only a space of two centimetres being preserved anteriorly, and in which the ventricular bands vicariously acquired the function of phonatory bands. The accident was produced by a fall from a trapeze upon a stove, an angle of which was struck directly by the chin and the larynx successively. Some bloody sputa were immediately expectorated, but dyspnoea did not take place for a number of days. There

less; this is due not only to antiseptis but also to the fact that hospital labors are conducted with less interference and with a better understanding of the phenomena of labor.

GONORRHOEAL INFECTION IN THE MOUTHS OF THE NEWBORN.

DOHRN (*Ibid.*) has observed five cases where gonorrhœa in the mother has been conveyed to the infant's mouth. Ulceration and the deposit of membrane followed, in which gonococci were readily found.

PRACTICAL RESULTS OF THE EXAMINATION OF MOTHER'S MILK.

In the *Archiv für Kinderheilkunde*, Band xiii. Heft 1, 2, MONTI writes at length upon the practical results of the examination of the milk of the nursing woman. He has found that a specimen of mother's milk in which both specific gravity and percentage of fat are high (1030 to 1035 sp. gr. and 3 to 5 per cent.), and which shows little variation during lactation, is suitable to nourish a healthy infant. It should be observed that both these factors must be present, as excess or deficiency of fat may result from pathological processes; and on the other hand, increased specific gravity, with diminished fat contents, renders milk unfit for nourishment. Regarding the microscopic examination of the milk corpuscle, Monti observed such great and constant variations that he regards it of little moment as a means of diagnosis. Many of the factors commonly supposed to affect the quality of milk, such as age, number of pregnancies, and length of lactation, he found without influence. Menstruation rarely affects the milk of a robust woman; prolonged flooding and debilitating causes lessen the size of the milk corpuscles.

COMPLETE PROLAPSE OF THE PREGNANT UTERUS.

A case of complete prolapse of the pregnant uterus at six months is reported by BERNE (*Lyon Médical*, Nos. 14 and 15, 1891). The patient was pregnant for the fourth time, and had suffered for several weeks from the presence of the prolapsed uterus between her thighs. Difficult micturition and leucorrhœa had resulted. Replacement was easily effected and maintained by a tampon; pregnancy continued to a successful termination.

[We recently had occasion to note the remarkable tolerance exhibited by the pregnant uterus in a case of total prolapse at the fourth month in a working woman, who sought treatment at an out-patient clinic. Reduction was easily effected and a fairly good position maintained by a tampon, the mass of which was carded jute covered by cotton, the whole smeared with a lanolin-iodoform paste.—Ed.]

SOXHLET'S EXPERIENCE WITH STERILIZED MILK, WITH IMPROVEMENTS IN HIS METHOD OF STERILIZING.

In the *Münchener medicinische Wochenschrift*, Nos. 19 and 20, 1891, SOXHLET, whose name is so closely allied with the sterilization of milk, gives his conclusions regarding its value, and suggests an improvement in the manner of sterilization. Milk is placed in bottles, the whole in a tightly covered pail containing water. Instead of corks, he closes each bottle by drawing over its

OBSTETRICS.

 UNDER THE CHARGE OF

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 AN EPIDEMIC OF PUERPERAL FEVER.

This unusual occurrence in a well-conducted clinic forms the subject of an interesting narration by DÖDERLEIN, of Leipzig (*Archiv für Gynäkologie*, Band xl. Heft 1), whose contributions on the bacteriology of sepsis are familiar. Three cases of lymphatic infection by the staphylococcus pyogenes aureus and streptococcus pyogenes occurred, the focus of infection being supuration beneath an ill-fitting glass eye in a patient's orbit. In some manner the midwife who examined her infected her genital tract and that of two others, one of whom died. By control experiments upon animals it was observed that the union of the two microorganisms produced an especially virulent infection. From the standpoint of treatment the intra-uterine douche is of value as soon as high fever announces the infection; if delayed, the microorganisms are beyond the reach of the antiseptic and the douche is harmful. It is given by Döderlein by inserting a Cusco's speculum, washing out the vagina with sterile water and inserting a glass douche-tube into the uterus, through which sterile water is allowed to run until it is seen that the flow is uninterrupted. A 2 per cent. creolin solution is then used to thoroughly douche the uterus. For the treatment of puerperal peritonitis, he advises absolute rest, ice to the abdomen, antipyretics, and opium. He believes that internal examination for diagnosis should be as infrequent as possible.

 RAPIDLY FATAL PUERPERAL INFECTION.

As illustrating the rapidity of puerperal sepsis caused by infection with streptococci, FRITSCH (*Deutsche med. Wochenschrift*, No. 16, 1891) describes the case of a patient on whom total extirpation of the uterus was performed during an epidemic of puerperal sepsis in the wards of the hospital. Death followed the infection in thirty-seven hours, the post-mortem revealing disseminated sepsis, with swarms of streptococci.

 THE COMPARATIVE RESULTS OF HOSPITAL AND PRIVATE OBSTETRIC PRACTICE.

At the recent meeting of the German Gynecological Society DORHN (*Centralblatt für Gynäkologie*, No. 22, 1891) gave the results of the comparison of statistics of puerperal mortality in German hospital and private practice. Although more complicated labors occur in hospitals than in private practice, yet septic infection is less frequent and mortality from preventable causes is

comes. The opening is enlarged by the finger, the abscess emptied and irrigated, and the edges of the sac are stitched to the wall of the vagina. If needed, iodoform-gauze tampons are used. The best after-treatment is frequent irrigation; drainage-tubes should be avoided. If difficulty is experienced in determining the point of incision an exploring needle may be used. —*Centralblatt für Gynäkologie*, No. 23, 1891.

THE PATHOLOGY AND TREATMENT OF ECLAMPSIA.

KOFFER and KUNDRAT report (*Wiener klinische Wochenschrift*, No. 20, 1891) the case of a young, strong primipara delivered spontaneously who was attacked by eclamptic seizures eighteen hours after delivery. Death occurred twelve hours later in marked cyanosis. At the autopsy Kundrat found hemorrhagic hepatitis, eclampsia having been caused by ptomaine poisoning of hepatic origin.

[A similar case was reported by Paultauf and Kundrat in 1888.—ED.]

In 52,328 births, LÖHLEIN (*Centralblatt für Gynäkologie*, No. 23, 1891) found 325 cases of eclampsia; average mortality 20 per cent. In discussing methods of treatment, Cæsarean section is indicated when dilatation is not sufficiently advanced to permit delivery, when the child lives and is vigorous, while other treatment fails to subdue convulsions, icterus supervenes, and respiration and heart action are threatened. Medically, he relies on heavy doses of morphine.

THE INFLUENCE OF PREGNANCY UPON RESPIRATORY METABOLISM.

ODDI and VICARELLI (*Lo Sperimentale*, Fascicolo No. 2, 1891), from an interesting series of carefully tabulated experiments, conclude that during pregnancy there is an increased consumption of hydrocarbons, derived from the waste of nitrogenous material resulting from fetal nutrition and growth. This is observed in the study of the respired air during pregnancy with comparison of weight.

TUMORS OF THE PLACENTA.

ALIN (*Nordiskt medicinskt Archiv*, Häft 1, 2, 1891) describes three placental tumors observed in the obstetrical clinic at Stockholm. The cases in which the tumors occurred were in other respects normal pregnancies and labors. Alin finds that such tumors have nothing to do with the uterus or membranes. Most of them are fibro-myxomata, rich in vessels, resembling angiomas. They exercise no influence in most cases upon pregnancy or labor.

ECTOPIC GESTATION.

An ovarian pregnancy is reported by EBERHART (*Centralblatt für Gynäkologie*, No. 24, 1891) in the person of a multipara three months pregnant, with symptoms of suppuration in the abdomen. The uterus was slightly enlarged, a tumor as large as a hen's egg upon the left of the uterus. When the tube and ovary upon that side were removed by laparotomy the tube was found occluded, and an ovarian abscess was present. The microscope revealed decidual cells in the wall of the abscess.

mouth a piece of sheet rubber, which is brought over the edge and secured by a rubber band which passes around the neck. The elasticity of the rubber allows air and steam to escape from the milk, while as the milk cools atmospheric pressure forces the rubber inward, closing the bottle. Milk is sterilized at boiling-point of the water in the pail for forty-five minutes. His experience leads Soxhlet to consider sterilized milk of great value, but not successful in all cases. Different sorts of milk can be sterilized with different degrees of success. The best milk is that of the ordinary meadow-fed cow; dry feeding (hay and grain) is not so good. The objections to sterilized milk lie in chemical changes affecting the emulsification of its fats, thus interfering with its digestibility. Good milk, when sterilized and kept closed, will keep several months.

[In common with American observers, Soxhlet recognizes the danger of contamination of milk by stable filth and bacteria from hay. Sterilized milk is far from being a perfect food, the gist of infant-feeding lying in careful study of each case, scrupulous cleanliness and regularity, the endeavor being to form a healthful appetite and gratify it.—ED.]

AN UNUSUAL COMPLICATION OF VERSION.

In the *British Medical Journal*, No. 1589, 1891, HELME describes an arm presentation in a primipara where the membranes had ruptured and uterine retraction had taken place. Version was unsuccessful until it was observed that the contraction-ring resisted the movements of the foetal shoulder. The prolapsed arm was then pulled down and the whole foetus was pushed up into the uterine cavity, when the version was readily accomplished. In an occipital presentation or an ordinary shoulder presentation, the foetal body forms the segment of a circle which offers no point of lodgment at the contraction ring.

THE TREATMENT OF SUPPURATION DURING PUERPERAL SEPSIS.

The surgical treatment of puerperal sepsis complicated by suppuration is illustrated by a case reported by MOORE, of Victoria (*Australian Medical Journal*, 1891, p. 179). The patient was suffering from severe septic infection with peritonitis, the left side of the abdomen being especially dull on percussion and prominent. On opening the abdomen six pints of foul pus was evacuated; the uterus was near the umbilicus, the right upper portion of the abdomen being shut off from the abscess by adhesions. An opening was made posteriorly in the lumbar region and a drainage-tube was passed, and also one in front, at the lower end of the abdominal wound. Irrigation with boric acid solution was used. The patient made a slow recovery complicated by temporary retention of pus, on one occasion terminated by purulent expectoration.

At the recent meeting of the German Gynecological Society FRITSCH advised the following method of treatment for recent pelvic exudates of puerperal origin. Using a speculum, the operator locates the exudate and with tenaculum forceps draws the uterus downward and to the opposite side. An incision is then made into the most protruding portion of the exudate, a stream of sterilized water being directed upon the incision so soon as pus

means of a silver plate, and were left *in situ* for three weeks. The displacement soon recurred in every instance.

KRUG (*N. Y. Medical Record*, 1891, No. 1) describes an ingenious operation which he calls "transperitoneal hysterorrhaphy," and has performed successfully several times. The patient being in Trendelenburg's posture, a sound is passed into the uterus and a catheter into the bladder. A median incision, not over two inches in length, is made just above the symphysis and the peritoneum is exposed. A Peaslee needle with a cutting point is then introduced at the left border of the wound, and with its edge the serous covering over the fundus uteri is scraped so as to leave a raw surface. The needle is then withdrawn slightly, is passed into the muscular substance of the uterus beneath the raw surface, emerges at the right edge of the abdominal wall, is threaded with silkworm-gut and withdrawn. Two sutures are sufficient to at once close the wound and to firmly attach the uterus in a position of anteversion. The entire operation should not occupy ten minutes, and can be supplemented by a periueorrhaphy if desired. The sutures remain for from four to six weeks. The writer affirms that with the patient in Trendelenburg's posture the intestines gravitate toward the diaphragm, so that it is impossible for them to receive injury. The catheter in the bladder indicates accurately the position of that viscus.

THE MECHANICAL CAUSES OF TORSION OF THE PEDICLE IN OVARIAN CYSTS.

CARIO (*Centralblatt für Gynäkologie*, 1891, No. 18) believes that the torsion may begin in consequence of a sudden muscular effort, as in lifting a weight during deep inspiration. The intestines are forced downward behind the tumor, and if they impinge on one side of it more than on the other, a partial revolution of the cyst occurs toward the side on which is the least pressure. Usually the resistance of the pedicle causes it to untwist and resume its former position after the pressure is removed, but if it is turned beyond 180 degrees further, torsion readily occurs.

THE ETIOLOGY OF VESICO-VAGINAL FISTULA.

WINTERHALTER (*Centralblatt für Gynäkologie*, 1891, No. 18) has collected 226 cases of vesico-vaginal fistula following labor, an analysis of which yields the following facts: 18.1 per cent. occurred in spontaneous, 81.8 per cent. instrumental deliveries. In 68.1 per cent. the forceps were employed, showing that their use is not unattended by danger. In the majority of the cases the pelvis was contracted. The writer advises craniotomy in preference to the forceps in cases in which impaction of the head is accompanied with œdema of the anterior lip of the cervix and of the external genitals, since under these circumstances 88.7 per cent. of the children are born dead. In a few cases the fistulae were caused by pessaries.

GONOCOCCI IN AN OVARIAN ABSCESS.

ZWEIFEL (*Centralblatt für Gynäkologie*, 1891, No. 20) calls attention to the frequent coexistence of ovarian abscess and gonorrhœal pyosalpinx, though

GYNECOLOGY.

UNDER THE CHARGE OF
HENRY C. COE, M.D., M.R.C.S.,
OF NEW YORK.

THE TREATMENT OF PELVIC SUPPURATION BY VAGINAL HYSTERECTOMY.

POZZI (reprint from *Gazette hebdomadaire de Médecine et de Chirurgie*, 1891) opposes Péan's radical procedure, as recently recommended by Segond, who thinks that vaginal hysterectomy is preferable to abdominal section in cases of disease of the adnexa. The arguments advanced in favor of the former are the lesser danger attending it, its greater efficacy, and the absence of any external cicatrix. Pozzi does not deny that cases of pelvic suppuration may be cured according to Péan's method, but he does not believe that adhesions can be broken up and foci of pus evacuated as well as when the abdomen is opened. While it must be admitted that removal of the adnexa sometimes fails to cause atrophy of the uterus, as shown by the persistence of hemorrhage, the latter symptom can usually be removed by the curette, without the necessity of total extirpation.

The greater mortality of vaginal hysterectomy as compared with abdominal section, is shown by the published statistics of the two operations. In the former operation there is no opportunity to correct errors in diagnosis by an explorative incision, hence it is not a procedure to be generally recommended.

[It seems incredible to the English reader that the learned author, whom we now recognize as the representative of French gynecological surgery, should be compelled to bring forward so many arguments against a method which reflects little credit upon the humanity of the profession. No man in this country, however great his reputation, could report a case of total extirpation of the uterus for pyosalpinx without evoking indignant protests. In spite of statistics, we can only regard this heroic treatment as a distinct retrogression on the part of our French *confrères*, more to be regretted because of its distinguished adherents.—ED.]

VENTRO-FIXATION OF THE UTERUS WITHOUT OPENING THE PERITONEAL CAVITY.

CRESPI (*Gaz. degli Ospitali*, 1890, Nos. 20 and 22) has operated four times successfully by the following method: The patient is placed in the lithotomy posture with the hips elevated. A median abdominal incision is made, exposing the peritoneum. The uterus is then anteverted on a sound and is held in contact with the anterior abdominal wall, while several sutures are passed through the edges of the wound and into the muscular substance of the fundus.

WILLIAMS (*American Journal of Obstetrics*, 1890, No. 7) reports seven cases in which he adopted Kelly's suggestion of anteverting the uterus and passing two sutures of silkworm-gut through the abdominal wall and into the fundus by means of a large curved needle. The sutures were secured externally by

CLOSURE OF CERVICO-YESICO-VAGINAL FISTULA FROM THE SIDE OF THE BLADDER.

BAUMM (*Archiv für Gynäkologie*, Bd. xxxix. Heft 3) reports an interesting case in which he followed Trendelenburg's suggestion to close complicated fistulæ by exposing and incising the bladder, as in epicystotomy, and suturing the edges of the fistula from within. The patient had had extensive sloughing after a tedious labor, as a result of which there was a large cervico-vesical fistula with extensive cicatrization involving the entire vaginal fornix, so that it was impossible to expect a successful result from a plastic operation. The patient was placed in Trendelenburg's posture. A median incision was made just above the symphysis, the pre-vesical space was exposed, and the bladder was opened by a transverse incision two inches and a half in extent, through which the interior of the viscus could be thoroughly inspected. The mouths of the ureters were surrounded by the cicatricial tissue at the edge of the fistula, but were located by passing a probe into them. The borders of the fistula were denuded, an assistant aiding by making pressure upon them *per vaginam*. Eight silk sutures (having a needle on each end) were passed down into the vagina, where they were drawn through by the left hand of the operator, and subsequently tied with the aid of a Simon's speculum. The upper wound in the bladder was closed with a double row of sutures, muscular and sero-serous, a T-shaped drainage-tube being inserted. After tamponing the pre-vesical space with iodoform gauze, the abdominal wound was closed. The patient had a tedious convalescence, and six weeks after the operation there remained a large fistula at the site of the abdominal wound which never closed. It was necessary to perform a slight secondary operation in order to completely close a small cervico-vesical fistula.

PUBLIC HEALTH.

UNDER THE CHARGE OF

EDWARD F. WILLOUGHBY, M.D.,
OF LONDON.

THE ACTION OF COMMON SALT ON PATHOGENIC ORGANISMS.

This question, which, apart from its more purely scientific aspect, has a very practical interest in its bearing on the extent to which the salting or "pickling" of pork and other provisions may be relied on for the destruction of the germs of disease, was taken up about a year ago by Dr. C. J. Freytag at the instance of Professor Förster. It is well known that salt serves to preserve meat—*i. e.*, to prevent its spontaneous putrefaction, by abstracting water from the tissues and coagulating the albumin, though solutions of 10 per cent. dissolve out a portion of the myosin, which, together with the potash, salt, and extractives, may be recovered from the brine. But the question to be decided was whether it would destroy the vitality of microbes, as it ecr-

the fact of a common origin has never been proved. He has recently demonstrated beyond doubt the presence of gonococci in the contents of a Graafian vesicle, situated in the centre of a suppurating ovary. This important fact shows that the cocci possess a greater migratory power than has been supposed, that they are not confined to mucous surfaces, but under certain unknown conditions may be carried through the blood- and lymph-vessels to distant parts. This agrees with Bumm's experience in finding the cocci in peri-urethral abscesses and in the knee-joint in cases of gonorrhœal rheumatism.

FORCIPRESSURE IN ABDOMINAL SURGERY.

KOCKS (*Sammlung klin. Vorträge*, 1891, No. 21) claims the following advantages for the forceps: 1. If proper instruments are used, there is no surer way of controlling hemorrhage from the broad ligaments than by forcipressure. 2. The operation is shortened, hence the patient has less shock and less danger of septic infection. 3. The technique is greatly simplified, which is always of advantage to the operator. 4. Parenchymatous oozing is eliminated, and with it the danger of subsequent septic infection through the bleeding surface. 5. Clamps are easily rendered aseptic, while perfect asepsis cannot so readily be assured with silk and animal ligatures. 6. As the forceps are removed at the end of twenty-four hours, the abdominal cavity then remains free from any foreign body, hence there is no danger of suppuration or persistent irritation from the presence of ligatures. 7. Thorough drainage is insured.

SALPINGO-OÖPHORECTOMY.

ZWEIFEL (*Archiv für Gynäkologie*, Bd. xxxix. Heft 3) reports 77 cases of salpingo-oöphorectomy with a single death, statistics as yet unsurpassed by any other operator. He notes several interesting clinical facts, viz.: The majority of the cases of pyosalpinx were clearly of gonorrhœal origin; the accompanying localized peritonitis probably results from mixed infection rather than from pure specific poison. Many patients with pyosalpinx suffer from catarrh of the large intestine of a peculiarly obstinate character, which may be due to specific infection, although this has never been demonstrated bacteriologically. The different bacteria which may cause pyosalpinx are gonococci, streptococci, and tubercle bacilli. The occurrence of an evening rise of temperature in a well-marked case of pyosalpinx is an important diagnostic point in tuberculous salpingitis. Salpingostomy, or simple drainage of the tube without extirpation, should not be practised if pus is present.

As regards the ultimate effect of removal of the adnexa, the writer states that where the ovaries were entirely removed menstruation ceased; when it persisted it was in cases in which, on account of adhesions, a portion of the stroma probably remained. The majority of the patients reported that there was no change in their sexual feelings; a few complained that these were extinguished. The psychoses, so often described, were observed in only one instance.

Erysipelas. No effect was produced on the cocci of this disease by an exposure to a saturated solution for two and a half months.

Staphylococci of pus resisted a like solution for five months.

Diphtheria. The Klebs-Löffler bacillus in pure cultures made from a virulent and fatal case were unaffected after three weeks in a saturated solution.

Tubercle. Portions of the organs of a guinea-pig that had died of tubercular peritonitis, and the sputa of the same animal, were, after two or three weeks' exposure to a concentrated solution, inoculated into the abdomen of a healthy guinea-pig, which died of tuberculosis a month later. But lest this one might have been infected by the diffusion in the air of the room of the dried sputa of the other, Dr. Freytag made a fresh series of experiments precluding such an accidental source of fallacy, and found that gelatin cultures of the bacillus were not injuriously affected by the action of concentrated solutions for three months.

Nodules of "Perlsucht," after eighteen days' immersion in brine, were used for the inoculation of rabbits with invariable success; in fact, three months' steeping, a far longer period than is ever employed in pickling meat for human food, in no way lessened the infective power of the bacilli.

Galtier's experiments, which gave a different result, were made with the expressed juices, not with the organs or tissues themselves.

In conclusion, Dr. Freytag observes that though it might be urged that, the bacilli of anthrax being killed and the toxins assumed to be dissolved out into the brine, such flesh, if free from spores, might be eaten with safety, it would be in practice impossible to ascertain or to guarantee the absence of the spores.

The question of tuberculosis is, however, of greater practical importance, on account of the frequency of the disease and the fact that much meat from animals suffering from it in different degrees finds its way into the market.

Since boiling alone suffices to kill the bacilli—i. e., provided the interior of the meat be raised to that temperature—the previous pickling, as suggested by the authorities at Lyons, is superfluous, and, indeed, by inducing a false security, would be worse than useless.

These experiments possess a peculiar interest for a country where the pickling of meats constitutes an important industry.—FREYTAG, *Zeitschr. f. Hygiene*, 1890.

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DR. EDWARD P. DAVIS,
250 South 21st Street, Philadelphia.

tainly does that of parasites higher in the scale of animal life—in fact, whether it could be looked on as a disinfectant as well as a preservative. The ancient Greeks, as Dr. Anagnostakis has reminded us, employed solutions of salt as lotions in the treatment of wounds, and A. Seibert has recommended it for the local treatment of diphtheria. But R. Koch and Baumgarten had been surprised at the little or comparatively no effect of several substances, of which salt was one, commonly supposed to exert a destructive action on low forms of life; and Merteus had been equally disappointed in his experiments on the cocci of pus. These casual researches had, however, been conducted without adequate precautions, and Dr. Freytag determined to carry out his investigation exhaustively, beginning with the pathogenic bacteria of diseases proper to domestic animals, but possibly communicable to man in the consumption of their flesh. He made use not only of pure cultures of the bacteria, but of the tissues of diseased animals—*e. g.*, the tubercular nodules found in the bodies of cattle suffering from “Perlsucht.” To imitate the conditions presented by the process of pickling, he used so much salt that a portion always remained undissolved; in gelatin cultures this had the effect of liquefying the medium, when the bacteria and the undissolved particles of salt sank to the bottom of the tube, but with those in agar the colonies were simply covered by the finely-powdered salt.

At regular intervals of time fresh sowings were made from the salted cultures, and animals, kept in clean and airy cages, were inoculated from each. He insists on the fact that for many years no case of natural tuberculosis had occurred among the guinea-pigs, and only a couple of cases, more than two years ago, among the rabbits kept in the laboratory for experimental purposes.

The results in each disease were as follows:

Anthrax. The spores, raised on sliced potatoes, were, as Koch had already shown, in no way affected by continuous exposure to the action of concentrated solution of salt for six months. Not so the vegetative forms, which were invariably killed after two hours’ steeping of the organs containing them in a concentrated solution. Although even a saturated solution failed to kill the spores, the limits under which their germination and further development were possible were presented by solutions of 7 per cent. to 10 per cent. of salt in Löffler’s bouillon.

Typhoid. Koch-Ebert’s bacilli, obtained from the spleen of a man who had died from enteric fever, and grown on sliced potato and on Koch’s gelatin, retained their vitality and power of development in fresh media after six months’ exposure to a concentrated solution of salt.

Rothlauf, or “pig scarlatina.” These bacilli, provided by Pasteur, remained unaffected after two months.

Cholera. Koch’s comma-bacillus. The growth of these was luxuriant, liquefying the entire mass of the gelatin; and the salt, when added in excess, was deposited. Sowings made from these tubes after four, six, twelve, and twenty-four hours were all alike without result. Another series of experiments showed that eight hours’ exposure to a saturated solution was invariably fatal to these bacilli, and that the highest concentration in which they could live was 7 per cent, but that 5 per cent. (not 2 per cent., as Uffelmann had asserted), was required to check their growth in any perceptible degree.

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The Classification of American Waters.

BY A. C. PEALE, M. D., *Consulting Chemist, United States Geological Survey.*

There is a fashion in Mineral Waters as in most other things. Sulpho-Carbonated waters promise to come to the front in the near future, and at the present time Lithia Waters occupy a prominent place. I know of but one Lithia Water, however, in which the analysis shows enough Lithia proportionally to entitle it to a distinct and separate place on every scheme of classification; that one is from the *Londonderry Lithia Spring, of New Hampshire.*

FRANK BILLINGS, M. D., *Professor of Clinical Medicine and Clinical Diagnosis, Professor of Physical Diagnosis and Clinical Medicine, Chicago Medical College.*

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FROM E. E. DENNISON, M. D., *Surgeon R. C. S. Edinburgh, Scot., Licentiate College of Pharmacy, Ire.; Intern and Licentiate of Midwifery, Rotunda, Ire.; Surgeon Provincial Fever Hospital.*

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HENRY M. FIELD, M. D., *Professor Therapeutics, Dartmouth Med. School, etc.*

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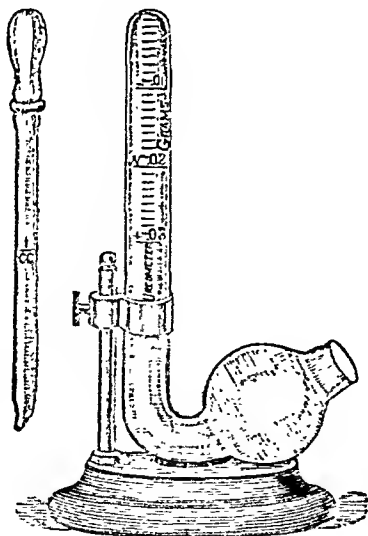
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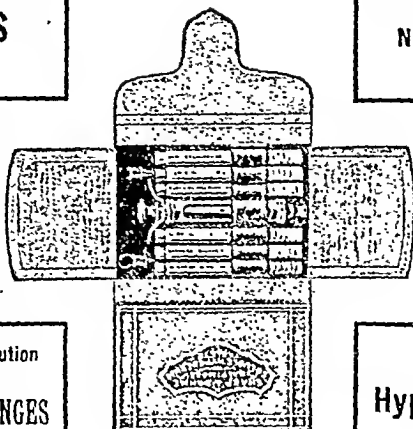
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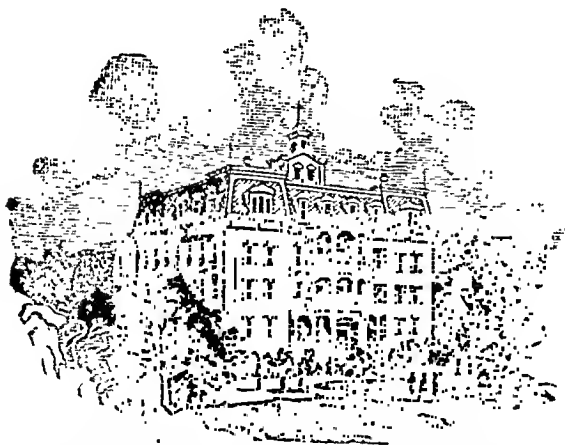
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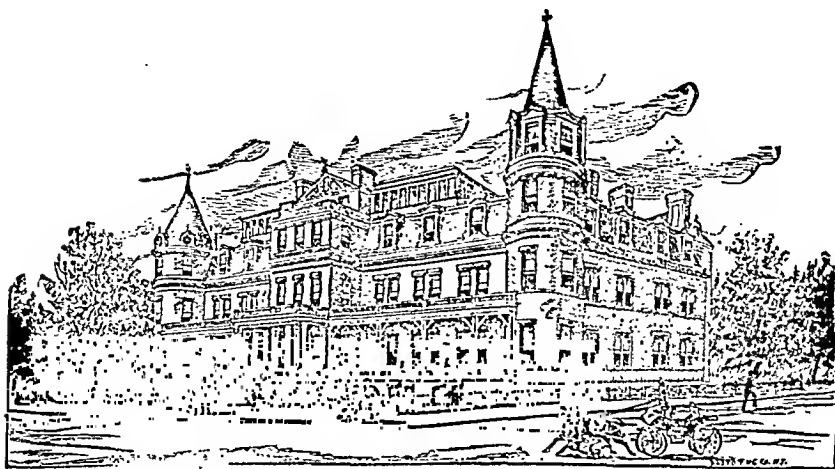
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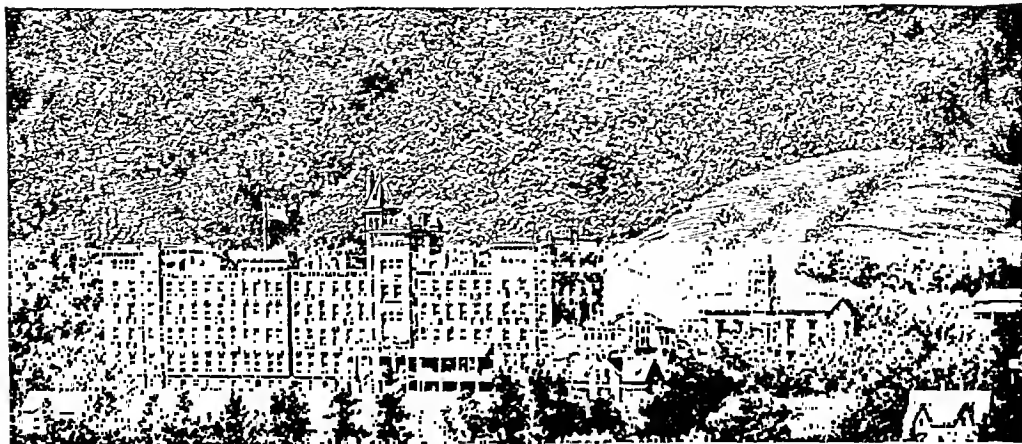
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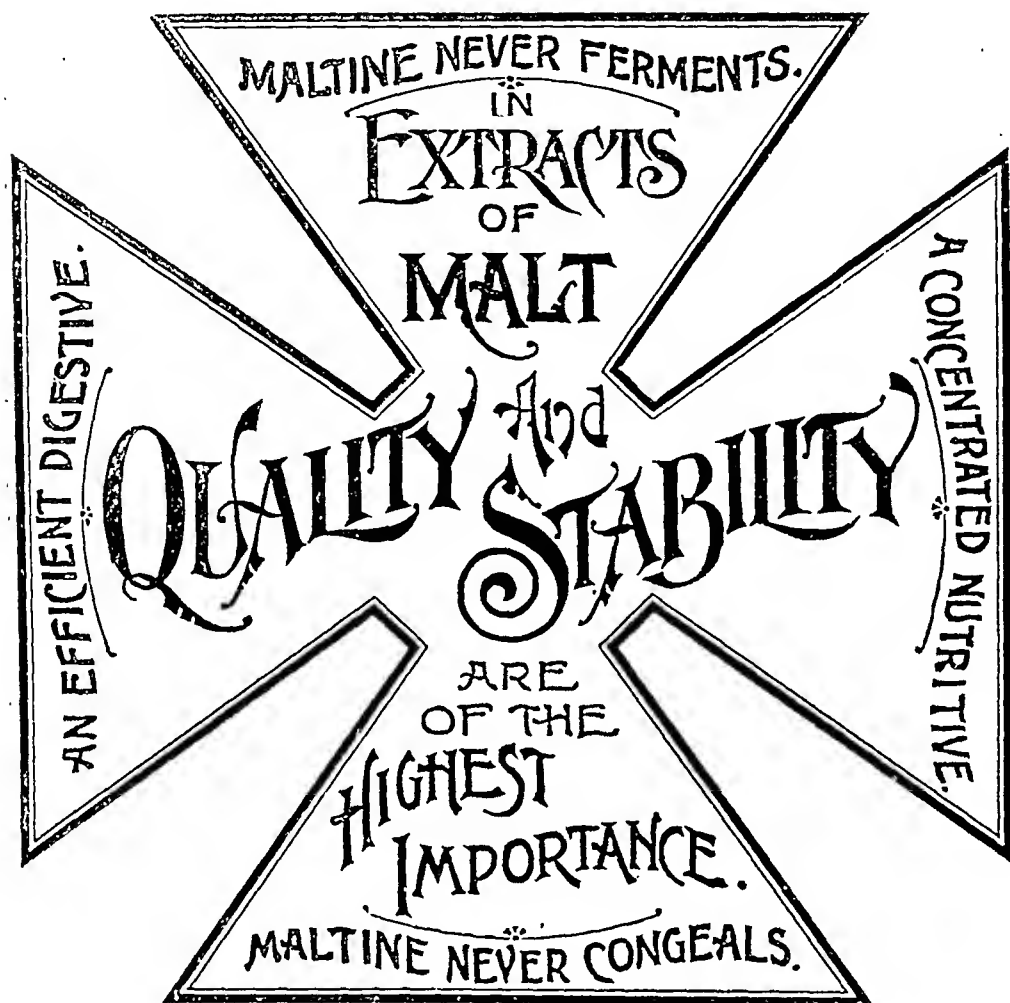
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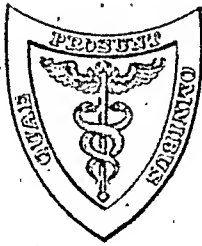
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SURGERY.

	PAGE		PAGE
Stab-wounds of the Spinal Cord	303	Erosive Balano-posthitis	307
Intestinal Anastomosis by Means of Vegetable Plates	305	Dupuytren's Contraction	308
Union of the Divided Ulnar Nerve by Plastic Operation	306	The Microörganisms of the Normal Urethra	308

OPHTHALMOLOGY.

The Influence of the Retinal and Cho- roidal Circulation on the Nutrition of the Eye	309	Validity of Weber's Law in the Case of the Light-sense	311
Cortical Visual Centre in Monkeys	310	Nutrition of the Crystalline Lens and the Development of Cataract	311

OBSTETRICS.

The Porro Operation, with Invagina- tion of the Stump	313	Secondary Perineorrhaphy during the Puerperal State	316
Forceps to the After-coming Head	314	Elevation of Temperature of Obscure Origin in the Puerperal State	316
Oecipito-posterior Rotations	314	Tubal Abortion	316
Puerperal Eclampsia	314	The Inhalation of Oxygen in Treating Newborn Infants	316
The Hepatic Lesions of Eclampsia	315	Cæsarean Section	316
The Poisonous Properties of the Urine during Pregnancy	315		
Twin Pregnancy in a Primipara	315		

GYNECOLOGY.

Diverticulum of Rectum Simulating Cyst of the Vaginal Wall	317	Surgical Treatment of Tuberculous Peritonitis	322
Papillomatous Ovarian Cystoma	317	The Influence of Castration upon the Ciliated Epithelium of the Uterus	323
Etiology of Hæmatosalpinx	318	Development of Carcinoma in the Cicatrix after Ovariectomy	323
Anatomy of the Tubes	318	Torsion of Fibroid Uterus	324
Diagnosis of Carcinoma Corporis Uteri	318	Primary Sarcoma of the Cervix Uteri	324
Gonorrhœa in the Female	320		
Ichthyol in the Diseases of Women	321		
Deciduoma	322		

PÆDIATRICS.

The Iodides in Scrofulous Children	325	Intestinal Catarrh in Children	326
Acute Pemphigus in an Infant Infect- ing the Mother	325	Hemorrhage following Peritonsillar Abscess	327
Tubercular Meningitis in Children	325	Tetanoid Convulsions in an Infant	328

CONTENTS.

ORIGINAL COMMUNICATIONS.

	PAGE
Five Cases of Cerebral Surgery. I. and II. For Epilepsy Following Trauma. III. For Insanity Following Trauma. IV. For Cerebral Tumor. V. For Defective Development. By W. W. KEEN, M.D.	219
Rest and Food in the Treatment of Anæmia and Anorexia Nervosa. By JAMES F. GOODHAAT, M.D., F.R.C.P.	238
The Back in Railway Spine. By F. X. DERCUM, M.D.	247
Inoculations for Yellow Fever by Means of Contaminated Mosquitoes. By CHARLES FINLAY, M.D.	264
Urea and Serous Membranes. By C. S. BOND, M.S., M.D.	269

REVIEWS.

A Treatise on Fractures and Dislocations. By Frank H. Hamilton, M.D., LL.D.	277
The Study of Malaria, as Observed in Algiers. By Dr. Edward Pepper, L.F.P.	279
Practical Treatise on Electricity in Gynecology. By Egbert H. Grandin, M.D.	281
Chemistry of the Stomach (Normal Digestion—Dyspepsia). By Prof. Georges Hayem	282
Report of Carlos F. MacDonald, M.D., on the Execution by Electricity of William Kemmler	285

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

	PAGE		PAGE
Treatment of Epilepsy by the Con-joined Employment of Bromide of Potassium and of an Agent Capable of Rendering the Nervous Centres Anæmic	287	Whooping-cough Treated by Atomization	290
New Uses for Saline Preparations	288	Treatment of Constipation in Children by Abdominal Massage	291
An Expecto- rant in Acute Bronchitis	290	Aloin	291
		Diuretin for Removing Dropsy	292
		Treatment of Chyluria by Thymol	292

MEDICINE.

Malta (Remittent) Fever	293	The Practical Electro-therapeutics of Graves's Disease	299
Double Empyema	294	The Treatment of Tuberculosis by Means of Subcutaneous Injections of Eucalyptol, Guaiacol, Iodoform	299
Fibroid Pneumonia	294	Diabetes and Vascular Sclerosis of the Pancreas	300
Points of Affinity between Rheumatoid Arthritis, Locomotor Ataxia, and Exophthalmic Goitre	295	Hemiatrophy of the Tongue of Peripheral Origin	300
Bradycardia, or the Slow Heart	295	Pulmonary Abscess	301
Senile Chorea; Mania; Recovery	296	Morvan's Disease	302
On the Treatment of Intussusception by Injection or Inflation	296	Congenital Occlusion of the Oesophagus; Communication between the Trachea and Oesophagus	302
Cerebral Suppuration following Influenza	297	Partial Nephritis	302
The Significance of Cheyne-Stokes Respiration in Cardiac Disease	297		
Influenza Epidemic of 1889-90	298		

randa of measurements, etc., and possibly make a sketch of the convulsions exposed, with an accuracy which is greatly to be desired. Especially is this true at present, when the functions of such parts of the brain as are stimulated are as yet, in man at least, not so accurately determined as is desirable. The most correct measurements possible and all the observed phenomena are, therefore, of the greatest value, and should be minutely described.

The first two cases were both of epilepsy following trauma.

CASE I. *Traumatic epilepsy; operation; implantation of decalcified bone; recovery with partial integrity of bone, and no subsequent attacks for eight months.*—C. J., colored, aged about thirty-nine years. Her history is very indefinite, owing to her want of intelligence. She was sent to the Infirmary on October 8, 1890, by Dr. Merritt, of Easton, Md. She is married and has had eight children; four are dead—one with spasms, one with diarrhœa, one with marasmus, one, cause unknown. Three of the four living children are healthy. Family history otherwise negative and uncertain, except that one sister is weak-minded, and at times has to be kept in confinement.

In childhood she was playing on a cellarway when a window-sill fell from a high window and struck her on the left side of the head, and she remained unconscious for some time. No operation was done at the time of injury, although it was spoken of. Her first spasm occurred not long after the injury. In the first eleven years that followed she had but two attacks—six years after the injury and five years later. Then they began to be more frequent, and this frequency has been steadily increasing until now they are only a month or two apart, and sometimes she has two in one day. The character of the convulsions has always been precisely the same. They begin with flexing of the fingers of the right hand on the palm, followed by forced and extreme supination of the wrist. She then either lies down or falls down and screams. She loses consciousness completely, and knows nothing till she finds herself crying and the right arm moving in a spasmodic manner. She does not sleep after an attack, nor is there any paralysis of motion or disturbance of speech. She always has a severe headache, however, at the site of the former injury for a day or so. She does not bite her tongue. Once or twice she has urinated during an attack; no defecation.

Her general health was good until last winter, when she had influenza. Intelligence poor, but perhaps, excepting memory, no more so than usual. Between the attacks she is free from headache unless the site of the injury is struck. Hearing is good; smell and taste subjectively unimpaired. Has dyspepsia, sluggish bowels, no œdema, no cough. Menstruation regular.

Dr. de Schweinitz reports on the eyes: "Perfectly normal, oval discs, fundus of each eye healthy. Visual field for form normal. Color fields not taken."

Status presens: A fairly well-nourished colored woman. Face symmetrical; no facial palsy. Answers questions quite well. Tongue protruded straight. Arms symmetrical; is right-handed. Measurements of two arms practically identical. Dynamometer: R. 97.5; L. 118.

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FIVE CASES OF CEREBRAL SURGERY. I. AND II. FOR EPILEPSY FOLLOWING TRAUMA. III. FOR INSANITY FOLLOWING TRAUMA. IV. FOR CEREBRAL TUMOR.
V. FOR DEFECTIVE DEVELOPMENT.

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In this paper I report, with some observations, five cases of operations involving the brain, which have been done in the last eighteen months. These are all the cases operated on by myself in the Orthopædic Hospital, except that in addition to these, one case (microcephalus) has already been reported¹ and a second (probable tumor) is not yet terminated, and hence I shall report it hereafter. For most of the careful histories of these cases I am indebted to Dr. F. A. Packard.

I would suggest that in operations on the brain it is of great advantage to have a stenographer present at the operation, and so many surgeons now have their regular stenographers that this can often be done very readily. This is of especial value during the stimulation of the brain by the faradic battery, when the stenographer can instantly note and describe the exact point on the brain which is stimulated and the precise phenomena in face, neck, arm, leg, trunk, etc., that occur on such faradization. It is very difficult to write quickly enough all the details that are observed at such a time, and they are either lost or become confused, and, even if this does not follow, the operation will be seriously delayed. The stenographer can take such dictation instantly, together with memo-

¹ THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES, June, 1891.

ceps till it measured 6.3 cm. (2.5 inches) antero-posteriorly by 3.8 cm. (1.5 inches). At the first bite of the rongeur forceps the face on the left side became markedly contracted, while on touching the dura the contraction became much more marked. The right eye was a little open at the same time. This sensitive point on the dura was 7.3 cm. (2 $\frac{3}{4}$ inches) to the left of the middle line and the same distance back of the external angular process. When this point was faradized the left side of the face became contracted, the right thumb persistently twitched, and the respirations became longer. The same effects were produced by faradizing the bone in the neighborhood. On faradizing the brain cortex for a very brief time just below the upper margin in the middle of the opening there was marked adduction and abduction of the thumb followed by extension of the fingers of the right hand, with clonic convulsive movements (flexion and extension) of the whole right arm. These movements persisted for nearly a minute after the stoppage of the current, and resembled the epileptic attacks. The point touched on the brain was 5.8 cm. (2 $\frac{1}{4}$ inches) to the left of the middle line, and 7.3 cm. (2 $\frac{3}{4}$ inches) from the external angular process.

With a knife a circular incision was then made in the brain substance, including the point which had been stimulated, without producing movement of any part. The diseased cortical matter and some underlying white matter were removed with a sharp spoon until apparently healthy white matter was exposed. No phenomena were observed during this removal, the left face even gradually relaxing during the manipulation. The pulse was now 78. At this time the right eye was directed upward and outward, the left in a parallel direction, but to a less extent. On pinching the scalp with the forceps the same drawing up of the face took place as was noted when the battery was applied on the dura.

The battery was now applied to the white matter lying beneath, which had been exposed by the removal of the gray matter, and as nearly as could be ascertained, exactly below the point which had produced the brachial monospasm. This caused flexion of the ring and little fingers with abduction of the hand and flexion of the elbow, the phenomena stopping immediately upon the removal of the electricity instead of continuing and developing into a typical attack, as they had done before. There was no movement of the right face during the electrical or other stimulation, but there was constant contraction of the left face.

After all bleeding had been controlled and a small rubber drainage-tube inserted, a piece of decalcified tibia from a bullock, perforated by several openings, was fitted accurately to the defect in the skull, with the exception of a notch for the exit of the drainage-tube. The decalcified bone-plate was stitched to the scalp with chromicized catgut, superficial horsehair drainage inserted, and the scalp sewed with interrupted chromicized catgut sutures. A gauze dressing with rubber dam was applied.

On the day following the operation flexion and extension of the right hand were entirely lost in both fingers and wrist. She could prevent the hand from falling in extension, but not in flexion; that is, the flexors were entirely paralyzed, the extensors only partly so. Flexion and extension at the elbow were slight but present. Movements of the shoulder also present, but paretic. Right leg unaffected. Left angle of the mouth elevated slightly. Movement present in all face muscles;

Knee-jerk on right side much exaggerated; on left, slightly so. Sole tap, R. marked, L. absent. Front tap, R. marked, L. obtained with difficulty. Achilles' tendon reflex marked on both sides. Plantar skin reflex absent on both sides. Gait natural. On standing with her eyes closed there is marked swaying, but she does not fall.

3.5 cm. ($1\frac{3}{8}$ inches) behind and 5 cm. (2 inches) above the external angular process, on the left side, is an abrupt bony elevation. Toward the median line, from and behind this, there is a marked depression of a roughly triangular shape, the apex pointing backward. The anterior border of this depression is much thickened and the superior border lies 4.5 cm. ($1\frac{3}{8}$ inches) to the left of the middle line. The posterior extremity lies 1 cm. ($\frac{3}{8}$ inch) behind the left fissure of Rolando. The antero-posterior diameter of the depression is 5 cm. (2 inches), and its vertical measurement is 3.7 cm. (1.5 inches). The cranial index is 77.7 and the fissure of Rolando, therefore, runs at 70.3° .

On October 15th she had a convulsion, which is thus described: "She screamed several times for about thirty seconds, then fell to right side, and right hand became first convulsed, the fit involving first hands and face, and lastly the legs. Jerking of the head was most marked. The legs twitched slightly, then she crossed the left one over the right. There was no frothing. She seemed to be conscious and tried to speak, but could not utter more than one word. The duration of the fit was three minutes. She knew it was coming on, and grasped her right hand above the wrist. The pupils were equally dilated and responded to light just at the end of the attack."

Operation, October 29, 1890. The usual semilunar flap, with the convexity upward, was made, and the depression was exposed. The bleeding from the scalp was, as usual, controlled by hæmostatic forceps. The defect in the skull was found to be covered by a thin membrane, which allowed the pulsations of the brain to be plainly seen, and this membrane was slightly attached to the margin of the opening in the bone. The membrane was matted together with brain tissue and a little of the brain tissue was torn away in its careful removal. Two or three apparent cysts were opened in the removal of the membrane. During this part of the operation the face was drawn strongly to the left, the right eye being a trifle open. The muscles of the left side of the face moved at times, the angles of the mouth being drawn strongly upward, the grimace then slowly relaxing. The patient seemed not to be completely anesthetized and was groaning. No movement of arm or leg on either side was detected.

At the posterior lower part in the opening of the skull the bone was apparently 1.5 cm. ($\frac{3}{8}$ inch) thick, thinning just in front of it to 3 mm. ($\frac{1}{8}$ inch) thick. It was found that a fragment of bone had been depressed and grown fast, and thus gave the impression of greatly thickened bone. The projecting fragment was removed by forceps.

The entire face continued to be drawn tightly upward during this manipulation, the mouth markedly so, while this was not so marked at the angle of the eye, nor was the brow markedly contracted. The brain at the bottom of the depression was of a dark-gray color, with a brownish tinge, evidently being disorganized brain tissue. The cerebral surface exposed was of concave shape, the depression at the deepest part measuring $1\frac{1}{4}$ cm. ($\frac{1}{2}$ inch). The edges of the opening in the skull were irregular as well as thickened, and were removed by the rongeur for-

being about once a week. After fourteen years of age they became less frequent, only coming about once a month; this not being the result of medicine. For the last six years they have only occurred about once in three months, except that in March last, without any apparent reason, unless possibly due to his having sat over a hot fire, there were three attacks in two days. His last fit was about the middle of last September.

There is no exciting cause for them, unless possibly coming into a warm room with a close atmosphere, and once or twice excitement has caused them. He has only had one attack during the night. He has often been struck in the neighborhood of the scar, though not on it, without producing any fit. At the beginning of an attack he has a confused feeling in his head, not lasting long enough usually to give him time to sit down; once he had time to cry "Look out!" Twice he has run a short distance during the premonitory mental confusion. Loss of consciousness comes on quickly without any cry. He usually falls forward and frequently injures his face; he always bites his tongue. He does not know that any part of the body is first or chiefly affected. There is no urination or defecation during the attacks. After a sleep of about an hour, followed by a weak and drowsy feeling and slight headache for a couple of hours, he is able to work the rest of the day.

Status presens: General health is good, although he appears to be not well nourished. His skin is pale; appetite good; bowels regular. His memory, he thinks, is not so good as formerly. No pain anywhere. Eyesight is not very good, but no worse than it has always been. His hearing is good. Dr. de Schweinitz reports that he "has a high grade of astigmatism, probably mixed. Pupils and external ocular muscles normal; discs rather gray-red in color, with some contraction of right visual field. The contraction is concentric and of no localizing importance. Pupils equal and react well to light." There is no facial palsy. Tongue clean and protruded straight.

Dynamometer: R. 153, L. 123. He is right-handed. No increase of biceps, triceps, or wrist tendon reflexes on the left side; wrist tendon reflex on the right side increased; others normal. No increase of muscular irritability in arms. Knee-jerk greater than usual, but equal on both sides. Ankle-clonus absent on both sides. Achilles' tendon reflex equal on both sides. *Æsthesiometer:* On dorsum of hands, two points felt at one inch on both sides; on dorsum of feet, $1\frac{1}{2}$ inches, on both feet.

His head is of a natural shape and symmetrical, excepting for the scar. In the right parietal region is a large stellate scar, approaching an anchor in shape, the arms of the anchor being below and forming a shallow crescent with the convexity downward. At the junction of the pole of the anchor and the anterior arm there is a depression of 3.9 cm. ($1\frac{1}{2}$ inches) in the long diameter (obliquely upward and forward) and 2 cm. ($\frac{3}{4}$ inch) in short diameter (transversely). The depression is 1.4 cm. ($\frac{1}{2}$ inch) deep. The edges of the depressed area are well defined and rounded off, with no sharp points. There is no pulsation to be seen or felt. The floor of the depression is hard and resistant. There is slight tenderness on pressure over the scar.

The longest portion of the scar (obliquely) measures 5 cm. ($2\frac{1}{2}$ inches), the short arm 2.5 cm. (1 inch). The centre of the depressed area is 9.6 cm. ($3\frac{3}{4}$ inches) from the middle line and the same distance

eyelids could be closed. In speaking, the left side of the mouth was drawn upward slightly more than the right.

On the second day there was no area of anæsthesia. If anything, a pin-prick caused more pain on the right than on the left hand. There was no difference in distinguishing the two points of an æsthesiometer, being on dorsum of hands 2.5 cm. (1 inch), dorsum of second joint of fingers 7 mm. ($\frac{1}{4}$ inch), outer side of forearms 6.7 cm. ($2\frac{1}{2}$ inches), outer side of upper arms 5 cm. (2 inches).

On the fifth day the drainage-tube was removed, and on the seventh the horsehairs and the sutures were removed, the wound being entirely healed. On the eighth day she was out of bed. On the tenth pulsation was still evident over the old defect in the skull, the lower half of the flap feeling soft, the upper half being more firm. There was slight improvement in the movement of the right shoulder, but not in the elbow, wrist, or fingers. The stiches through the implanted bone were removed on the eighth day.

On the nineteenth day she moved the fingers for the first time, the index finger leading, with slight motion in the thumb and middle finger. There was slight extension at the wrist. She stated that while gaping a few days previous to this the fingers had become markedly flexed. On the twenty-third day she left the hospital and went home, moving the three radial fingers more freely, but the two ulnar ones not at all. Wrist barely movable, especially in flexion; elbow could be almost entirely flexed or extended, but slowly and with difficulty. The decalcified bone had become concave in its lower part over an area the size of the tip of the index finger, but it was apparently secure.

June 11, 1891 (eight months). There have been no attacks since the operation, and her general health and mental condition are far better than before. Dynamometer: R. 25, L. 50; but for practical purposes the right hand is far more useful than would be judged by this difference. Its movements are complete in range, but lack power, and she cannot yet cut her meat at table. It is, however, constantly bettering. The trephine opening is well closed with firm tissue, but in part at least it yields to firm pressure to such a degree as to make it doubtful whether this is bony or not. It, however, affords an excellent protection to the brain.

CASE II. Epilepsy following a trauma; operation; implantation of sheep's bone; recovery, with subsequent necrosis of implanted bone, but only three attacks in nearly six months, each caused by the operations.—G. H., aged twenty-three years, was sent to the Orthopædic Hospital November 13, 1890, by Dr. H. M. Schalleuberger, of Rochester, Pa. His mother died of consumption, aged forty-two; his father of renal dropsy. One brother died of consumption, aged twenty-eight. Otherwise the family history is good. While teething he had an unknown number of convulsions, but no others prior to his accident. In 1874, at the age of seven years, he was kicked on the head by a horse, and remained unconscious for a few hours. Trephining was soon afterward begun, but his physician says that it was not completed, owing to shock. Three pieces of bone, however, were removed. At least one had penetrated the brain for an inch. His recovery was slow and he was delicate for a year or more. So far as he remembers, his first fit was in 1876, two years after the accident, and his attacks have always been of the same character throughout. The attacks eventually became more frequent,

In view of the large cavity between the skull and the brain I directed that he should lie with the right side of his head down, so that the blood should not accumulate in this cavity, but escape readily.

December 13th (22d day). On the night of the operation he had a severe and prolonged attack for nearly three-quarters of an hour, and ten days later, when terrified by a patient in the ward, who threatened to attack him, he had another fit, but only a slight one. Since then he has had none.

The drainage-tube was removed at the end of forty-eight hours and the horsehairs at the end of five days. For a week after the operation I dressed the wound daily, for the reason that a large amount of bloody serum accumulated between the flap and the bone, as was easily determined by palpation. This separated the bone from the flap except at the two points of suture and the area immediately about them, and, of course, accumulated under the bone between it and the brain, and caused me great anxiety lest the bone, being separated from its blood-supply, should undergo necrosis. Each day I was able gently to press out the fluid and bring the flap down to the bone, and as soon as I did so I could readily determine that the sheep's bone was not fast to the rest of the skull. At the end of a week the serum gradually ceased to accumulate. At the end of two weeks the bone was still slightly loose. I have not examined it between December 6th and to-day, when I found it, as far as gentle manipulation could determine, absolutely firm. The wound itself healed without trouble.

17th (26th day). He goes home to-day. In examining him yesterday I thought I detected a slight crepitus between the piece of sheep's bone and the skull. The external wounds have healed and he looks sound and well. He has no pain and has had no further attacks.

January 15, 1891 (2 months). He writes that a few days ago a small reddish blister appeared on the old scar. There is a slight bloody discharge from it daily. There is no pain, swelling, nor soreness. His general health is good.

April 25 (5 months). On his return to the hospital a few days ago I found over the site of the former operation a small opening in the scalp, with bare white bone exposed. The edges of the skin were blue and undermined with a small amount of pus, which was exuding. Under either the edges of this opening were cut away, and on making a slight crucial incision through them the edges of the dead bone were reached, and it was easily removed. The piece of sheep's bone, which had originally been 2 by 1½ inches, had nearly disappeared, and the small fragment that I removed was rather less than half an inch in diameter both ways. Its edges were worm-eaten and soft. Underneath it was a distinct membrane in almost all respects resembling the dura. It was not opened, but by touch showed that under it was apparently a fluid. The wound was then wiped out with pure carbolic acid and dressed with ordinary bichloride gauze.

May 16 (21 days after second operation). The night of the operation he had a severe attack, since which time he has had none. The wound has healed readily excepting a very small area, scarcely the size of a pea. He is to go home in two or three days. He tells me that he feels immensely better than he did when he had the constant irritation of the gradually disintegrating bone. I have advised him to change his occupation, in order to have less stooping and lifting, either of which causes him considerable annoyance.

back of the external angular process on the right side. The cranial index is 79. The anterior extremity of the depression just touches the line of the Rolandic fissure at a point 8.3 cm. ($3\frac{1}{4}$ inches) from the median line.

Operation, November 21, 1890. A semicircular flap was reflected, exposing the defect in the skull. In loosening the flap from the margin of this defect considerable cerebro-spinal fluid escaped *per saltum* synchronously with the pulse. The loose tissues filling the opening seemed to be more or less cystic. At least two or three ounces of the fluid escaped. A small loose spicule of bone was engaged in the membrane or tissue filling the opening. This tissue was next dissected away. The edges of the opening were greatly thickened, so that the squamous portion of the temporal was almost a quarter of an inch thick. The diploë in the parietal border of the opening was so marked that the bite of the rongeur was perceptibly divided into two distinct stages, one for each table. The thickened bone around the opening was bitten away till the opening measured 5 cm. (2 inches) obliquely antero-posteriorly, and 2.8 cm. ($1\frac{1}{4}$ inches) in a transverse direction. No dura covered the brain at the site of the injury. The brain tissue was now exposed. A moderate amount had adhered to the tissue filling the opening and had been torn away with it. The remaining portion was normal as far as eye and touch could perceive, and none of it was removed. One small branch of the middle cerebral was ligated. The convolutions could not be recognized, as they were to a large extent fused together.

The right hemisphere failed to fill the cavity of the skull to such an extent that not only was the surface of the brain depressed opposite the opening, but a space existed between the right hemisphere and the dura at least one-third of an inch across, so that one could look under the edge of the bone two and a half inches, away up toward the falx.

At this point my assistant, Dr. W. J. Taylor, removed a piece of bone from the skull of a young sheep which had been brought to the hospital and killed at that moment. The piece selected about corresponded in curvature to the curvature of the patient's skull, and the edges of it were bitten away by the rongeur forceps so as to fit the opening accurately. From the time this piece was removed from the sheep's skull till it was inserted in the patient's it was kept in a bichloride solution, 1 to 2000, at 100° to 105° F., and most of the trimming of this bone was done while it was immersed in this warm solution. Dr. Taylor, of course, used the same antiseptic precautions in his operation on the sheep as I did on the patient.

Two points were bitten out of the piece antero-posteriorly to allow for the passage of horsehairs for drainage, and two openings were made, not only for drainage, but also to allow the passage of two sutures, by which it was sewed to the flap of the scalp, and which were tied externally.

Before the opening was closed the brain was faradized at the following points: First, 7.1 cm. ($2\frac{7}{8}$ inches) to the right of the middle line; 2.5 cm. (1 inch) behind the bi-auricular line. Second, 7.6 cm. (3 inches) to the right of the middle line, and 3.8 cm. ($1\frac{1}{2}$ inches) posterior to the bi-auricular line. The current was more than strong enough to move my own muscles, but no phenomena were observed.

The wound was then closed and the usual dressings applied, the gauze being of the strength of 1 to 2000.

other hand, if the wound cannot be made aseptic the insertion of the bone will not increase the danger to the patient. I think, therefore, that the attempt to close the gap in the skull by means of such a procedure should at least be attempted. If the bone survives it is a clear gain. In both of the cases just reported I made a secondary attempt to close the opening, by different processes, in the two cases. In the first case I inserted decalcified bone after the manner Senn has advised, and with a very happy result, both as to the survival of the bone and the health of the patient. The facility with which this can be done is far superior to the transplantation of bone from an animal, for we can always have such decalcified bone in an antiseptic solution in a jar, ready for an emergency; whereas an animal cannot be so readily secured. Moreover, it requires fewer assistants, for there is but one operation to be done instead of two—one on the patient and one on the animal—with equally strenuous antiseptic precautions. As a minor point, also, it is far less expensive.

In the second case I filled the gap with a piece of bone from a sheep's head. Had the case run a typical course I think success would have attended the effort, but it was a most unfavorable case for such a trial. First, because the brain tissue did not fill the cavity of the cranium, and there was a hollow underneath the transplanted bone. This hollow was necessarily filled up by blood-clot of considerable size. Had the brain tissue and the bone been in contact I think the chances of the survival of the bone would have been better. Moreover, the large accumulation of serum which took place between the transplanted bone and the flap separated the bone for the greater part of the time during an entire week from the flap of the scalp, and thus both on the under and upper surface the transplanted bone was cut off from its blood-supply, excepting at the slight points of contact where the sutures passed through the piece of bone and the scalp. That it should apparently have survived for three months, and then, with disintegration of the bone, attended with suppuration, should have produced no endocranial mischief, I consider a very encouraging fact as to future attempts. I have had no opportunity to try the novel suggestion of Fränkel, which has been carried out by Hinterstoisser and Fillerbaum, to fill such openings with a celluloid plate. They state that it has been done three times with success (*Wiener med. Presse*, Jahrg. xxxi. No. 42). Nor have I yet tried König's method of chiselling loose the outer table of the bone along with the flap of scalp, leaving this attached by its base, and swinging it around to close the defect, while the site of the displaced osseo-cutaneous flap is covered by a skin-graft by Thiersch's method.

Fourthly, as to the results so far as the epilepsy is concerned, the time is as yet too short to give any definite opinion as to permanent results, but yet thus far the improvement has been very manifest.

REMARKS.—These two cases suggest several points of importance. First, that in injuries of the brain immediate surgical interference may prevent the deplorable consequences which may arise, of which these two cases are illustrations. Of course, these particular accidents occurred at a time when surgeons were not equal to such interference; but they point out what the proper method of treatment of such cases should be in future. After wide and careful shaving and disinfection of the entire wound, not only the soft parts, but also the bone should be properly trimmed; and to this I would add that the lacerated brain substance should be removed, for experience is accumulating to a large extent to show that the scar tissue resulting from laceration is a very fertile source of epilepsy and other troubles, far more so than the scar which results from a clean incision in the brain tissue. Of course, no needless incursion should be made into sound brain tissue, but better some of this, I believe, than to leave lacerated cerebral tissue. Even if some sound tissue be removed and paralysis follow, this will be only temporary; for after such excisions I have invariably found that the function has been restored in time, and generally nearly to the normal.

Secondly, if the dura be extensively lacerated, the lacerated portion should also be removed for like reasons. I would suggest that its place should be supplied from the pericranium by taking a considerable piece from the under surface of the flap of the scalp and sewing it to the dura, thus closing the gap. In doing this the osteogenetic (under) surface should be turned uppermost, so that if any bone should form, it should not grow downward toward the brain, but upward to fill the gap in the bone. A few interrupted sutures at the margin will fix it well in place. It will serve another important purpose also, namely, by closing the gap in the dura by early adhesions it will prevent the tendency to a fungus of the brain, so marked in every case where there is any considerable gap in the dural membrane, especially if there has been incision or laceration of the brain tissue. Since this idea occurred to me I have only had one opportunity of testing it, in a case operated on over three months ago at the Jefferson College Hospital. The piece of pericranium was cut entirely loose, turned downside up, and sewed to the dura, filling up the gap left by the removal of some of the dura, and up to the present time it has perfectly retained its vitality.

Thirdly, the question of immediately closing the gap in the bone by decalcified bone-plate. I do not know of any case at present in which this has been done as a primary step to remedy the defect in the bone tissue at the time of the accident. It seems to me, however, a very reasonable proposal, with probably only one serious drawback. In order that such a bit of decalcified bone shall retain its vitality, it is very essential that the wound shall be absolutely aseptic, and, of course, in a wound produced by an accident this is difficult to insure. On the

The patient was admitted to the Orthopædic Hospital and Infirmary for Nervous Diseases October 2, 1890, under the care of Dr. Sinkler, who kindly asked me to see the case with him, and to whom and Dr. Packard I owe the history. His physical condition at that time was good, but he complained of constant headache, especially in the right parietal region at the cicatrix. He had an anxious expression and heard voices constantly. No delusions of persecution. He was quiet and docile, and for the most part sat alone in the corner of the ward. On shaving the head a stellate scar was discovered over the posterior and upper angle of the right parietal bone; a depression in the skull can be felt through the scar. There were several other small scars on both sides of the scalp, but none of any great apparent importance.

The patient is right-handed. Dynamometer: R. 80, L. 90. Left hand steady, but right shows a tremor on squeezing the dynamometer. Dr. de Schweinitz examined the eye-ground and found it perfectly normal. Knee-jerk slightly exaggerated on both sides; station good. There is no word-deafness, word-blindness, aphasia, or agraphia.

Professor Cattell, of the University of Pennsylvania, kindly examined the patient, and made the following report: "He did not show an abnormal condition as regards sensation, movement, speech, or intelligence, although these all seemed to be somewhat subnormal. No difference in sensation areas, discrimination of weights, or pressure causing pain, was found in the two hands. Dynamometer pressure was, however, weaker with the right hand than with the left, and was accompanied with more tremor. Equal pressure was felt, greater on the scar and on the left side of the scalp than in the median line and on the right side, and about half the pressure caused pain at the former points as at the latter."

After a consultation of the staff it was decided to do an exploratory trephining.

Operation, October 17, 1890. The scalp was adherent to the skull under the cicatrix, with a marked depression 1 cm. ($\frac{3}{8}$ inch) in length and 3 mm. ($\frac{1}{8}$ inch) in depth. A one-and-a-half-inch trephine was applied at this point. The skull was quite vascular. The disc of bone removed was rather thin, but the under surface appeared normal. The bone was thickest at a point corresponding to the scar and the dura mater was more firmly attached at this point than elsewhere. The dura appeared normal. The brain did not bulge when the dura was opened, but appeared somewhat flattened at a point corresponding to the thicker part of the button of bone. The pia was somewhat cedematous. Several white patches were observed in the course of the veins. There were no adhesions on the under side of the dura, and passing the finger under the dura revealed nothing abnormal. The dura was therefore closed with interrupted sutures and the flap of scalp sutured in place. The button of bone was not replaced. A small cicatrix over the right parietal bone, three inches above the ear, was also excised. The bone was normal underneath.

The patient made an uneventful recovery, and got up in two weeks after the operation. The pain in his head was very much less, and he did not hear voices, nor did he have any other delusions after the operation. Discharged November 16, 1890. He returned home, and on December 1 was reported in very good condition, being considered by his wife and employer much more rational than he had been. He was able to do some light work.

Fifthly, can we determine by faradism whether the brain tissue, which to the eye and touch seems normal, is really diseased or not? This is a question I am somewhat disposed to answer in the affirmative, although as yet I do not feel at all sure of my ground. My reasons for this possible belief are as follows: When the current is applied to a normal centre in the motor area and the electrode immediately removed, we obtain merely a contraction of the muscles represented at the point of such faradization, the muscular contraction ceasing upon the removal of the electrode, and also being limited to the muscles represented in this area. In Case I. it will be observed that when the current was applied for a moment to the *diseased* tissue a *typical epileptic fit* was produced, following the march of those which had been observed prior to the operation, involving other muscles beside those represented at the immediate point of the cortex which was stimulated, and continuing for half a minute or a minute after the electrode was removed. This same phenomenon I have observed in other cases. It is, however, also true that in some cases of focal epilepsy in which presumably the cortex is diseased, when the area is stimulated no such fit is produced. Whether there be any significance and value in the production of such a fit, such as the above question suggests, I do not know. I submit it for further observation and judgment.

CASE III. *Trephining for delusional insanity following trauma; temporary improvement.*—T. N., aged forty-four years, German; mining boss. Family history negative; no insanity. Syphilis denied. Has been a drinking man, but has enjoyed good health until twelve years ago, when he was thrown from a horse, striking on the top of his head. No immediate serious symptoms followed, but after a time he began occasionally to hear imaginary voices, particularly when excited after drinking. Seven years ago (five years after the prior accident) he was badly beaten by some laborers, one of the injuries being a severe scalp wound and injury to the right parietal bone, together with other cuts in the scalp. He was taken to the Drifton Hospital, and was perfectly rational, but after two or three days became delirious from erysipelas. After a month's time the wound was healed. While in the hospital he had some delusions as to hearing. These continued after he left the hospital, and in January, 1890, they became very marked, so that he would sometimes leave his work to meet an imaginary person. These delusions last July culminated in an attempt at suicide. An imaginary voice told him that he was about to be killed by someone who was pursuing him. Another voice said to him, "Don't let them kill you, but do it yourself." Accordingly he procured a revolver and shot himself between the third and fourth ribs near the nipple line of the right breast, with a 38-calibre ball. The ball was extracted at the angle of the scapula.

He was again admitted into the Drifton Hospital, suffering from traumatic pneumonia and delusions. The wound entirely healed, but his mental condition remained unchanged. He could often foretell an attack by a peculiar headache which preceded the delusions, together with insomnia and refusal to eat. Delusions of sight were also present.

This has persisted to a greater or less extent ever since. After the first attack his appetite became ravenous and for a week he rapidly gained strength. At the end of a week after this attack he vomited his breakfast immediately after eating it, and the frontal and occipital headache, which had remained severe from the onset of his first attack, was much intensified, and he was compelled to go to bed again on account of this. The vomiting only appeared on the first day, but the nausea and headache continued. After the recovery from this attack his condition remained about stationary until October 25, 1889, when he began to improve, and was able to walk alone in the street, though he lacked confidence in himself, owing to the disturbance of vision and a slight dragging of the right leg.

December 1, 1889, he had an attack of nausea and headache, lasting three days, and after a lapse of ten days he had another. During the last attack some jerking of the right arm was noticed when he used it, as in brushing his teeth, and slight aphasia reappeared. His bowels were quite constipated. There was no weakness of the sphincters until after his admission to the hospital, when he had nocturnal incontinence of urine. No shortness of breath or palpitation; no œdema; no cough. Sleep has been profound, but no somnolence. No emaciation.

He was admitted to the Orthopædic Hospital January 3, 1890, under the care of Dr. S. Weir Mitchell, who kindly asked me to see the case with him, and to whom and Dr. Packard I owe the history.

Status presens, January 3, 1890: A spare man, with gray hair, blue eyes, and sallow skin; temporal arteries somewhat tortuous and the walls slightly leathery. No arcus senilis. There is no scar on the head; no tenderness to mediate or immediate percussion. No difference of percussion noted except that due to the varying thickness of the bone. Tongue clean and protruded straight. Breath offensive (possibly due to taking KI?). Examination of chest and abdomen negative. There is slight rigidity of the posterior cervical muscles. Dynamometer: R. 75, L. 62 on one occasion, but on another, and probably more accurately, R. 75 and L. 85.

On exertion there is coarse, rapid tremor of the hands and arms. The outstretching of the arms causes a bilateral equal rapid tremor. When at rest there is no tremor. The superficial abdominal reflexes normal. Knee-jerk exaggerated on left side and somewhat more on the right. Ankle clonus present on both sides, most marked on the right. No patellar clonus. Muscle reflexes poorly developed. The wrist, biceps and triceps reflexes could not be elicited. With eyes closed he cannot touch the tip of his nose accurately with either forefinger. Intellect sluggish; answers slowly and in an abstracted manner, seeming to brighten up at times by a great effort. No alteration of hearing, taste, or smell.

When shown a pencil he called it "a pad from a table of envelopes," and later he called a key a "pad," although he both saw and handled it. Afterward when shown it again, he named it aright, but when shown a hairbrush called it a "key." He was told its proper name and again shown the key. When asked now what he would use the key for he said that "he would brush with it." His wife (with her eye-glasses on) then came in front of him, and when he was again shown the brush, he said that it was "what is usually known as eye-glasses." On another trial he called the key a "penknife," and when asked whether he would

May 28, 1891. Mr. Miller, Superintendent of the Drifton Hospital, informs me that he did admirably for some weeks, but about the 1st of May he left home, intending, he said, to go to the old country. As he has not been heard of since, and took a revolver with him, it is to be feared that his mental condition was as bad as ever.

REMARKS.—This case seems to be a good example of at least temporary good results achieved in some obscure functional diseases of the brain by exploratory trephining. Very possibly the slight pressure on the brain by the thickened bone or the irritation in the bony cicatrix itself, as well as the cicatrix in the scalp, may have been the cause of his marked delusions, so marked as to lead him to an attempt at suicide. But the resulting good was of very short duration.

CASE IV.—E. C. P., aged fifty-six years, American. Father died young from inflammation of the bowels. Mother died at eighty from debility. Patient is married and has four healthy living children. He had the ordinary diseases of childhood. There is no history of exposure to the sun. He has been subject to gastric disturbances. With this exception he has been entirely well until the onset of his present trouble. Syphilis denied.

Twenty years ago he fainted while in a hot room and struck his head against a cuspidor, receiving a scalp wound, which healed promptly. From the age of fifteen until the age of forty-six he was a jeweller, but for the last ten years he has been doing clerical work.

In May, 1889, his present illness began with pain over the eyes, most pronounced over the right side, and uninfluenced by any known circumstances. At first it was intermittent and of moderate intensity. This headache was the only symptom until August, 1889, when he had a spell of nausea for a week, and was compelled to remain in bed for three weeks. The headache was much intensified by this attack. While in bed he had several attacks of vomiting without retching. This was the first of a series of such attacks, after which all his symptoms were intensified and new ones were manifested. While in bed it was for a time noticed that he had difficulty in selecting words—for instance, asking for a plate when he wanted a drink, speaking of his pillows as ribbons, frequently interchanging yes and no. He seemed to know that the word used was wrong, and recognized the proper word when suggested to him, although it could not be ascertained whether he himself was able to say the word suggested. This aphasia was present for three or four weeks, but then passed away, and was not noticed again till after Christmas, 1889. On first getting out of bed he had considerable giddiness, but never fell. Change of posture markedly increased the giddiness and headache.

Early in August his memory and vision began to fail. He remarked that he could write short words, but not long ones, owing to the fact that if long he could not see both the beginning and end of the word. At the same time he noticed that he was unable to see people or objects approaching him from the right side. He was able to walk with closed eyes, but could not readily touch the tip of his nose with his right forefinger, his eyes being closed. On getting out of bed after his first attack it was noticed that his right arm and leg were slightly paretic.

He gradually sank, and died fourteen hours after the operation was concluded.

Post-mortem examination, February 5, by Dr. W. J. Taylor. Spleen normal, except an area of infarction; liver small and flabby, with fatty changes; kidneys congested and lobulated, with accessory renal arteries; a small cyst in the pyramid of the left kidney. Vermiform appendix six inches long lying on the surface of the ascending colon, with a complete mesentery. Other organs normal.

Head: The wound looks in good condition. The scalp comes off easily, and no marks of injury can be seen on the skull. The dura rather opaque, slightly adherent, and congested, the smaller vessels showing plainly. Surface of brain apparently normal; no congestion and no œdema on either side. Sinus empty; considerable effusion exists in the vertebral canal.

Brain: A large area of broken-down brain tissue was found at the site of operation—about 5 cm. (2 inches) in diameter. Beneath this is a hardened mass as large as a filbert, the centre exactly 5 cm. (2 inches) from the end of the occipital lobe and 2.5 cm. (1 inch) from the middle line. The part of the tumor removed at the operation is posterior to this and midway between the remaining hardened mass and the point of the occipital lobe. The cavity left by the operation appears to be 1.8 cm. ($\frac{3}{4}$ inch) in diameter, and at the base the hardened mass can be felt extending into the point of the cuneus, where it is in contact with the falx, 1.3 cm. ($\frac{1}{2}$ inch) from the extreme point of the cuneus and the same distance from the middle line, covering an area of at least 1.3 cm. ($\frac{1}{2}$ inch) in diameter. There is marked congestion of the smaller vessels on the surface of the convolutions at the extreme point of the cuneus. Beneath and between the outer convolution of the cuneus is a clot 5 cm. (2 inches) long. The angular gyrus was removed at the operation. The tumor has no limiting membrane, but invades the brain substance, white and gray alike. Base of skull shows nothing abnormal. Dr. Charles W. Burr kindly examined the tumor, and found it an infiltrating glioma.

REMARKS.—The diagnosis of the location of the tumor in this case was made by reason of his apraxia and sensory aphasia and the hemianopsia. The diagnosis was exactly confirmed, as will be seen by the operation and the post-mortem, with the exception that the tumor was not superficial, but much deeper than had been supposed. I think we ought to have been led to deem it deeper than we did, by reason of its relation to the cuneus, since a tumor involving both the cuneus and the angular gyrus ought to have been localized as deep rather than superficial; but in view of this condition and the possibility that the tumor might be removable, I think the operation was entirely justifiable. When I reached the depth that I did before I found the tumor, it was very clear to me that its removal was impracticable, and the post-mortem certainly convinces one of this fact.

Brain tumor, however, is necessarily and *per se* a fatal disease. Hence, I do not think that the fatal issue of this operation ought to be put over against the unknown possibility of the removal of the tumor until it was

use it to open a door said "yes." When asked to name it, he called it a "key-knife." Evidently the last preceding idea was carried over to the next object seen.

The letters A B were printed plainly on a piece of paper. He could not name them at first, but was evidently not paying attention. On a second trial he named and pointed to B, but also called A "B." He was then shown B again, and called it "C." When a key was shown him he could not name it, nor could he do better when the letters K E Y were shown with it, or by themselves. A pair of scissors and a piece of paper were handed him, and he was able to cut the paper properly with the scissors.

Dr. de Schweinitz reports as follows on the eyes: "Double optic neuritis. Discs swollen + 5 D. Some fresh hemorrhage at the outer side of right disc. Right lateral hemianopsia. Wernicke's pupillary reaction absent. No paralysis of external eye muscles."

Diagnosis: Cerebral tumor in the parieto-occipital lobe, and most likely in the angular and supra-marginal gyri, with pressure on the cuneus.

On shaving his head four scars were found, the first 1.9 cm. ($\frac{3}{4}$ inch) above theinion, beginning at the middle line and running obliquely upward and forward for 1.9 cm. ($\frac{3}{4}$ inch). Another scar, corresponding to the first, was present on the other side. 12.5 cm. (5 inches) in front of theinion, 1.3 cm. ($\frac{1}{2}$ inch) to the left of the middle line, is a small scar 1.3 cm. ($\frac{1}{2}$ inch) in diameter. 3.8 cm. ($1\frac{1}{2}$ inches) above the left meatus is a crescentic scar, the mouth of the crescent measuring 5 cm. (2 inches). Four inches in front of theinion in the middle line is a distinct blunt boss.

Operation, February 4, 1890. The median line, fissure of Rolando and the parieto-occipital fissure on the left side were marked on the scalp. At a point 1.3 cm. ($\frac{1}{2}$ inch) behind the latter, with the centre-pin 3.2 cm. ($1\frac{1}{4}$ inches) to the left of the middle line, a $1\frac{1}{2}$ inch button of bone was removed. The skull was very thick, but the button of bone showed no abnormalities. On examining the exposed dura, there was an indistinct sensation of hardness and tenseness below it. At the lower border of the trephine opening there was a decided adhesion of the dura. There was moderate but perceptible bulging of the tense dura, but no pulsation was visible. The dura was then opened, and as the opening was made the brain substance bulged markedly through it.

Faradism was then applied at various parts of the exposed cortex, without perceptible effect. An incision was next made through the cortex, when the left arm was pronated strongly several times. The right pupil was more dilated than the left, and there was lateral oscillation. An incision was then made in the brain substance at the postero-inferior border of the trephine opening, and the brain explored gently with the finger. There was a sense of an elastic, smooth, hard body about 6.3 cm. ($2\frac{1}{2}$ inches) below the surface, probably at the anterior border of the cuneus. A sharp spoon was introduced and an attempt made to determine the size and character of the hard mass, which was distinctly felt. Some pieces of the tumor were removed, but it was decided that on account of its size and depth it could not be removed, especially as the patient's condition was not good. The dura was united and the wound closed. The right angle of the mouth drooped, and there was slight rhythmical tremor of the right levator anguli oris.

or six. There is apparently an abdominal aura, as she grasps the abdomen with both hands at the beginning of an attack, and immediately afterward the convulsion becomes general. For the last six months choreiform movements have been noticed in all four extremities.

Her intellect is rapidly becoming more and more defective and her memory failing. There is considerable headache at the vertex. Bowels regular; no vomiting; menstruation regular. Her head is of peculiar shape, looking as if it had been rubbed between two boards moving in opposite directions, and the left side being markedly smaller than the right. From the meatus to the middle line on the left side is 1.5 cm. ($\frac{3}{8}$ inch) smaller than the right, and the left semi-circumference is 1 $\frac{1}{2}$ cm. ($\frac{1}{2}$ inch) smaller than the right. The right arm and leg are markedly smaller than the left, with contractures of the flexors of the hands and fingers. Knee-jerk normal on the left side; much exaggerated on the right. Slight ankle clonus on the right side; none on the left. Front tap and paradoxical muscular contraction unattainable on either side. The chest is somewhat deformed, the right side being largest posteriorly and the left largest anteriorly. Sensation not satisfactorily tested, owing to her mental state, but evidently much blunted on the right side, both as to touch and pain.

Professor Cattell kindly examined her on March 8, 1890, and reports: "The arrest of mental development and the asymmetry of the two sides of the body were so extreme that exact measurements were neither necessary nor easy to make. Reaction-time and rate of movement could not be determined, as she was unable to hold a telegraphic key in the right hand.

"Dynamometer pressure: right, 2 kgs. (obtained with difficulty); left, 20 kgs. Sensation areas: Distance at which points can be distinguished, right hand 12 cm., left 2.5 cm. (normal). Pressure causing pain was, right hand 1.6 kgs., left hand 3 kgs., forehead 1.6, head 0.6. Very hyperæsthetic, especially for the right hand and head. The time required to see and name colors was 1.467 seconds; words 1.819 seconds—much longer than normal, especially for words."

Operation, March 4, 1890. Ether. The fissure of Rolando on the left side and the median line were located with the cyrtometer and marked with an aniline pencil. An allowance of 1.8 cm. ($\frac{3}{4}$ inch) to the left of the middle line was made for the probable dislocation to the left of the superior longitudinal sinus, on account of the left atrophy. A 1 $\frac{1}{2}$ -inch button of bone was removed, its inner edge being 1.8 cm. ($\frac{3}{4}$ inch) from the median line. The skull was very thick; the dura bulged slightly. There was no especial spot of hardness or softness to be felt through it. The dura was then incised for two-thirds of the opening, the base of the flap being from the middle line. At one point, when the dura was opened a free hemorrhage took place, amounting probably to four or six ounces, evidently from a large vein. This was controlled with hæmostatic forceps. The brain substance was of an opaque, pearly-gray color, œdematous, but with no evidence of softening or cyst. The convolutions were very hard, feeling like tense worms. Three punctures were made in the œdematous pia, followed by an escape of serum and the subsidence of the pia to the brain tissue. The opening was enlarged downward about a quarter of an inch by the rongeur forceps, when it was noticed that there was a deep furrow extending downward and forward, of evidently atrophied brain. During these manipulations the

explored. I shall not soon forget the regret I experienced a few years ago, when at the post-mortem examination a tumor that I had declined to operate on shelled itself out of the brain during the manipulations for the removal of the brain; and the subsequent microscopical examination showed that the walls of the cavity in which it lay were not involved in the disease, although it was a sarcoma. Operation, which I unfortunately declined to do, might possibly have saved his life.

I cannot, therefore, even in the light of the autopsy, regret that this operation was done, as it hastened death but little. In the necessary uncertainty attending the diagnosis of cerebral tumors at the present time, I regard an exploratory operation in suitable cases as not only advisable, but needful. If we find an irremovable tumor, as a rule the patient will not die, and may even be bettered, as has been shown in a number of operations; and if he dies, it is anticipating by a very little what would have been the result without operation. If we do not explore in any reasonable case, we may find ourselves at the autopsy in the unenviable position which I recollect so vividly myself.

CASE V. *Trephining for defective development; death from hemorrhage and shock twenty minutes after the completion of the operation.*—M. F., aged eighteen years, kindly referred to me by Dr. John Van Bibber, of Baltimore. She first entered the Jefferson College Hospital February 10, 1890. After a careful study of the case I advised decidedly against operation, and she returned to Baltimore; but in March, 1890, she again came to Philadelphia and entered the Infirmary for Nervous Diseases, on account of the urgent request of her parents that an operation should be done. Her physician and some of my colleagues approved of an exploratory operation on the left side of her head, and I finally consented to operate.

Her history, as taken by Dr. Packard at the Infirmary, is as follows: The family history is negative, excepting that one of her nine brothers and sisters died of convulsions after an illness of thirteen hours, characterized by fever and right hemiplegia three hours before death; and another died at twenty-two, probably from tubercular laryngitis. At her birth, which was not instrumental, there was considerable difficulty and delay in delivering the head and the establishment of respiration. She had jaundice for three months after birth. At eleven months of age, while teething, she had a general convulsion. Prior to this time it had been noticed that she used the left hand more than the right, but until this convulsion it was unknown that the right arm and leg were partially paralyzed, the fact being discovered by the physician who attended her. At two years of age she fell from a baby-carriage, striking on her head, but without apparent ill effects. She began to talk at one year, but advanced slowly in speech. She began to walk at two years of age, dragging the right foot. At three or four years, right facial palsy and wasting of the right side of the face were noticed. During dentition she had five or six general convulsions. At three years of age she had an attack of *petit mal*; at irregular periods after this she had a few other attacks, and from ten years on they have been growing more severe and more frequent, until in the last month she has had five

operation on the brain. The hemorrhage was checked very quickly, but evidently hemorrhage from the brain, and especially a brain that is defectively developed, is much more serious *pro tanto* than from other parts of the body.

REST AND FOOD IN THE TREATMENT OF ANÆMIA AND ANOREXIA NERVOSA.

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THE present paper includes two distinct groups of cases; but inasmuch as they are often found together, and are both treated, so far as I am chiefly concerned, in the same manner, I have ventured to bracket them under one heading, although I must discuss each separately. And first of all, Anæmia.

This is a wide subject, and is a symptom of many diseases. I do not propose to deal with it when thus *symptomatic*, but only when it is a substantive affection. And, even thus, I shall not take it in its entirety, for there is anæmia on the near side of middle life which requires one method of treatment, and there is the anæmia which, on the whole, affects the declining half of life, which is styled *pernicious* and which requires a different handling. It is to the anæmia of young adults, and, almost without exception, of women—the disease that has received the name of chlorosis, but which is not always by any means chlorotic—of which I am going to write.

One may feel inclined to ask, "What is there in this subject that we do not already know?" To that I would reply: Probably, nothing; but it is a subject on which men who are entitled to an opinion differ considerably as to the right treatment, and therefore anyone who has convictions on the subject, one way or the other, is at liberty to air them. Not so very long ago no less an authority than Sir Andrew Clark read a paper on this subject in which he contended that anæmia was the result of the constipation which is its common accompaniment, and he advocated purgatives rather than iron as *the* remedy, although he *did* combine a little iron with his aperient pill. That paper traversed one of my most cherished convictions. There are not many occasions in medicine on which, perhaps, one can say, "*I know*," unhampered by any serious qualification. But, having been interested in these cases for many years, and having tested what I say in scores of cases, I venture to say I *know* that iron given properly will cure many of them and that attention to the constipation alone will not. I do not deny that the constipation is an important element in many cases and that it

hæmostatic forceps seizing the vein sprung open, and another free hemorrhage took place. I almost instantly placed my finger upon it, and got the bleeding vessel again controlled by the hæmostatic forceps; but the amount of blood lost before it was controlled amounted to about five or six ounces more. The patient became suddenly blanched, markedly cold, and collapsed. Hot saline solution was quickly injected into the cellular tissues, hot bottles applied, the legs elevated and the head lowered, and a hypodermic of $\frac{1}{6}$ of a grain of atropia sulph. given.

While my assistants were carrying out these directions a few interrupted catgut sutures were inserted in the dura; the forceps seizing the vessel remaining *in situ*, the scalp was sutured at a few points and a sublimate gauze dressing applied. Transfusion of salt solution was done, but before it could produce any effect the patient died, twenty minutes after the operation was completed.

Dr. C. W. Burr kindly examined the brain, and reports as follows: "Weight, when fresh, twenty-nine ounces Troy. The pia strips off easily. The entire left hemisphere is smaller than the right, measuring 18.4 cm. (7 $\frac{1}{4}$ inches) from the extreme point of the frontal lobe over the parietal lobe to the extreme end of the occipital lobe, while the right measures 23.5 cm. (9 $\frac{1}{4}$ inches). The convolutions are smaller than normal and the fissures irregular. The fissure of Sylvius is replaced by a deep wide valley extending almost to the occipital lobe, as if all the convolutions bounding it had atrophied and its walls fallen apart and its floor inward. Where the Sylvian fissure should be, the pia is attached closely. The temporal lobe is much shrunk; the fissure of Rolando is very short; the ascending frontal and ascending parietal convolutions are small and their lower parts absent; the corresponding crus cerebri and anterior pyramid is smaller than on the right side; the left hemisphere is harder than the right, and the left side of the skull smaller than the right. In the right hemisphere, apart from irregularities in the courses of the fissures, there seems to be nothing abnormal."

REMARKS.—In reviewing this case I regret very much that I did not adhere to my first decision not to operate; but her parents were so anxious that something should be done, in view of her steady mental and physical failure, that I finally consented. It was clearly an error of judgment. Moreover, the operation was not properly planned, especially in one respect: I allowed three-fourths of an inch for the possible displacement of the superior longitudinal sinus, which was one-eighth of an inch more than the difference in the measurements. This I thought sufficient, and rightly; but when I opened the dura, instead of making the base of my flap *from* the middle line, I should have made it *toward* the middle line, so that in lifting it I could have seen any large vessels emptying into the parasinoidal spaces, and so have avoided opening one of these spaces, as at the post-mortem I found that I had done, and this precipitated the hemorrhage which caused her death. That her death was caused by the loss of a moderate amount of blood is a matter of some importance to note, and should make the surgeon especially careful not so much to check as to avoid hemorrhage in any similar cases of

although dirty to look at, it is not bad to the taste. There are many people who cannot take pills; those who cannot will nearly always take the powder, and those who cannot take powders will take any amount of pills—indeed, the more the merrier. Perhaps I may be allowed to add that the pills should be made up with glycerin of tragacanth and coated with some of the soluble coatings now in use, lest they should pass through the intestinal canal unappropriated and the remedy thus come unjustly to be looked upon as a defaulter.

But there is yet another point about the iron treatment that is often not sufficiently insisted upon, viz., the *duration* of the course. Hundreds of anæmic people apply for treatment, and we ask, Have they taken iron? Oh, yes, say they, they are always taking it, and it does them no good. But when we come to inquire, they have taken a bottle, or perhaps two, and then left off for awhile. The average specimen of humanity still looks for his cure in his first dose, or, at least, somewhere within the depth of a six-ounce bottle; but it is needful to say that anæmia is not to be cured in so ready a fashion, and half the battle lies in a fair start. In dealing with these cases I always ask them, Are you prepared to carry out the requisite treatment? They, of course, profess themselves ready to do anything; whereupon I make them promise to take their medicine continuously for six weeks. Half-drachm doses, then, of the saccharated carbonate of iron or of reduced iron, given regularly three times a day over a course of six weeks, I consider to be so successful that I never can find heart to waste time (as I believe it is, for the most part) on other means of treatment, whether it be by potassii permanganatis or what not. Nevertheless, iron is a remedy that is not always successful in private practice. I have seen many cases, now, where I have been obliged to acknowledge that the iron treatment has been carried out in all respects properly, and yet the patient has not recovered her color satisfactorily. And in thinking the matter over there seems to me to be a difference in this respect between hospital cases and those in private. I look over the former and cannot remember one that has failed, and the only difference that I could think of was this, that they are invariably put to bed as soon as they come into the hospital and that they are also fed with at any rate a reasonable quantity of nourishment. In the better-class patient it is too often considered necessary only to give so much physic, food and exercise being left to the individual discretion.

Happily, Nature has some pretty stiff automatic checks, and the breathlessness of the anæmic is one of them; were it not so, anæmia of this sort would be a far more fatal disease than it is. But how can these patients expect to get well when they are so bloodless that they have nothing inside them to do a day's work upon, and yet they attempt to do that work. And what is that day's work? Well, "there is

may make the anæmia worse, but I am certain that it is not the primary factor; that the anæmia is *not* essentially a result of fecal absorption. But there are certainly some who think that iron will not cure all cases. Then I say, that is because one or two considerations are lost sight of, and, as regards iron, because it is not given properly.

Now, treading upon a man's pet corn is not a bad way of causing a little excitement; therefore, let me mention certain common ways of giving iron which, as regards this disease, are not what I call giving it properly. Giving a dose of dialyzed iron three times a day is one of these. Many people are very fond of this preparation of iron; and when it was first introduced dialyzed iron seemed to me to promise well, for it was a mild preparation which might be expected to be taken without upsetting the digestion. I tried it extensively, and came to the conclusion that it was of very little use when compared with other preparations. "It won't do any harm," as a celebrated physician once said of a remedy to a lady of my acquaintance. "Thank you," said she; "I did not suppose that it would, but that was not exactly my purpose in coming to you." To order dialyzed iron is, as far as I know, playing with the remedy and wasting time. The *mist. ferri comp.* of the British Pharmacopœia is an *old-fashioned*, but, as far as it goes, a good medicine; but here, again, to give an ounce of it three times a day does not satisfy the requirements of most cases, for it only contains the equivalent of $2\frac{1}{2}$ grains of sulphate of iron in carbonate to the ounce, and, although the better for this, patients are not thoroughly renovated, even after a protracted course of the drug. The sulphate of iron, again, is a good remedy, and has the great advantage that it can readily be combined with an aperient in a pill. But, good as it is, it has the drawback that it is difficult to raise the dose to the amount that I contend these patients require, for it has a tendency to act as an emetic. However, it *can* be pushed, if care be taken to do this slowly and steadily, for, like sulphate of zinc, tolerance is easily established and a sufficient dose can then be given. Some, again, are fond of the perchloride of iron, and it, also, is a valuable hæmatonic; but with *it*, even more than with the sulphate, the stomach is not tolerant of large doses in these cases, and therefore I do not give it. Some preparation, therefore, is wanted that *can* be given in *large* doses without disturbing the stomach, and, to my mind, such preparations are chiefly *two*: the saccharated carbonate of iron and the *ferrum redactum*, or reduced iron. There are numbers of people who will tell you that they cannot take iron, but it is seldom, indeed, that they have any difficulty with either of these preparations. They may either of them be given in half-drachm doses or more three times a day, and they may be given in pill or powder or lozenge. The powder is the least troublesome, and there is seldom any difficulty in thus administering it, if the patient be forewarned that,

or so. It is a curious disease, and, I believe, has a large nervous element as a factor in its production; but this I feel sure of, that, by its obstinacy and its tendency to relapse, it betokens a rather important constitutional vice, and that it is not a mere intercurrent affection that is treated and done with.

And now to turn to the other disease—anorexia nervosa: It will be remembered that this name was given by the late Sir William Gull to a series of cases which he recorded in the Clinical Society's *Transactions*, vol. vii. p. 22. These cases were very severe, associated with extreme emaciation, and more or less mental depression likewise; but, except for this, there was no apparent disease. A few similar cases have been recorded since, but all of them have been of such extreme degree, and associated with an amount of wasting so excessive—as may be seen by the woodcuts of the cases that have been published with the records—that I think there is no doubt that they have been looked upon as examples of a rare disease rather than as extreme cases of a very common one. At any rate, this is the point that I want to insist upon, viz.: mild *anorexia nervosa* is one of the very commonest diseases with which we have to deal, although it is, perhaps, not known by the name with which I would christen it.

The sort of case I have in mind is as follows:

A lady (these cases are always in women and most commonly but by no means confined to the upper classes), aged forty-two, who had never been strong, had been subject to fainting-fits, and had for long had recourse to strong purgatives for obstinate constipation, came to me for attacks of complete collapse; these were said to be so bad by her medical man, who came with her, that he really feared she would one day die.

I went into her history, and found that she was an extremely small eater, having an *objection* to meat, and being unable to take milk and eggs—a rather large order to cut entirely out of a daily dietary. Her attacks of collapse were thus described: She becomes faint and sick, with intense pain about the stomach, thighs, and spine. Her original weight was one hundred and sixteen pounds; she now weighs eighty pounds. Yet her vivacity seemed at times unimpaired, and she expressed herself as quite well and able to do anything.

This was her daily diet:

Breakfast. A cup of tea, without milk or sugar; a finger or two of toast, with very little butter.

Lunch. A very small piece of fish, a little bit of potato, a little salad, with plenty of vinegar; a little claret.

Entremet (afternoon tea, she fitly called it). A cup of black tea, without sugar or milk.

Dinner. Same as lunch.

Was I wrong, upon the facts before me, in characterizing her abdominal and spinal pangs as an expressive, not to say indignant, remonstrance on the part of her abdominal nerve-centres at the cruelty and ignorance with which they were being treated?

nothing the matter with them," so they do, after a fashion, much as other people do—that is to say, they think or are told that fresh air is good for them, so they drag themselves out to shop and walk. It is quite common to find young ladies thus affected going to early services at church, visiting in parish work, and as to not going to a dance because of their ailment, it would never occur to them for a moment. But after all, their chief exercise and exhaustion comes, I am persuaded, from the quite unnecessary tread-mill exercise they perform for the hundred and one things that they want which are downstairs when they are up and upstairs when they are down. And what do they do this upon? Generally no breakfast—a cup of tea they consider a sumptuous meal; a finger of meat, perhaps, for lunch, and, perhaps, again for dinner at the urgent importunity of their relatives; and if they are particularly well looked after these tiny meals are supplemented by an intervening sup or two of beef-tea, whose one grand virtue is that it has been stewed so long that you can "cut it with a knife."

To summarize, these cases, if at all far gone in the bloodless condition, require:

First, absolute rest in bed for ten days or a fortnight—three weeks is none too much for some cases—and they should not be allowed to take much exercise of any kind for the six weeks that their treatment lasts.

Secondly, they must be fed with good, wholesome food—four meals a day—beginning with milk and egg, which can be taken in the fluid state, and thus stowed away almost regardless of appetite. Good meat and vegetables can soon be added, and each meal should see some addition until a reasonable quantity is taken.

Thirdly comes the iron, as already detailed; and,

Fourthly, any mild aperient that may be necessary.

It is not my purpose to advert to the dangers that attach to the anæmic state. Whether they are few or many, it cannot be that this disease is an unimportant one, although it is so common and so generally remediable that one might well think it so. Unfortunately, it is so very common that the public have no idea of its importance as a disease, and therefore it requires some courage to send a patient to bed for a fortnight and to prescribe a Lent where physis shall replace the accustomed fasting.

But, as I am dealing with the point of curability of these cases, I should like to say that I have several times seen it stated that in distinguishing between pernicious and this form of anæmia that the pernicious form tends to relapse; the chlorotic form, not. This has not been my experience; quite the contrary. These cases frequently relapse after a time, and it is necessary to tell them that it will be so, and that at the first indication of pallor or breathlessness, or, it may be, amenorrhœa, they must return to their remedy for a short course of three weeks

too much. Last of all, they begin the round of physicians great on stomachs and their treatment. This means that for the most part they are still more rigidly fed by rule, and, in addition, they try, one after the other, the various remedies that are supposed "to go for" the stomach—the pepsins, the papains, the soda, the bismuth, the calumba, the mineral acids—according as the individual whom for the day they are confiding in thinks they have, according to his special bent, acid dyspepsia, atonic dyspepsia, gouty dyspepsia, or any other form of the many that have been described.

I have no special antipathy to these various drugs—they are all very useful in their way and if rightly used, even for these very cases I am discussing; but I want to insist, with all the force that is in me, that to treat these people for stomach affections is to do them positive harm. They are never cured by such means, and if they are moneyed people, as they often are, they go from one man to another until the whole round of great names is exhausted, suffer many things of them, and, in the end, think doctors as a genus a pack of fools, for they are worse than they were at the beginning.

We sadly want a little more common sense and real knowledge applied to the subject of diet. Our present practice stands self-condemned when we have to admit that of all the patients who apply for advice, three different printed sheets do for the lot. Such a method is clearly only a matter of routine; the individuality of the patient is out of the account altogether, and there are few things in which the individuality asserts itself more, which I may illustrate by two so-called dyspeptics whom I have seen quite lately: One, after detailing her discomforts, said: "But I am very peculiar, you know; I can eat *nuts* and *radishes* and all that sort of things." The other, after going through a long string of simple things which she could not digest, said: "But there is one thing that I can always eat." Quite thankful to hear it, for it sounded like progress, I inquired what it was, and she said, "*Lobster!*" I wish I had time to enter more fully upon this subject of diet and the many reasonless and, I believe, unphysiological dicta by which we are bound. But I am rather wandering from my subject.

However, these anorexia nervosas leave off first one thing, because they think it disagrees, and then another, and another, and so on until they are existing upon a most attenuated diet, and the wonder is that they are alive at all.

The explanation I would offer of these cases is a more fundamental one, and I take it from a common physiological fact of which we all have more or less cognizance. We all know that if we have to undergo an enforced fast, that at first very hungry, the appetite after a while goes off and we care not whether we have a meal or not. We often find ourselves in similar circumstances, too, when we have been unusually hard-

She was going out to India in three weeks from the time that I saw her, passage taken, and all things arranged. I mention these little details to enforce a point, viz., that you must be firm with these people; they don't appreciate the gravity of their condition, for use is a second nature to them, and they have got so accustomed to their miserable state of existence that they come and tell you, as this poor creature did, that they feel quite well. Further, they do appreciate very keenly the very disagreeable nature of the remedies proposed. I told her that, go to India or not, she must have six weeks of the *pâté de foie gras* treatment, and if the departure was a fixed and unalterable term it must be continued on board ship. She was put under the care of Dr. Andrews, of Hampstead. He concurred in the diagnosis, had her removed to a small home hospital, and carried out a six-weeks' course of feeding and massage; and I heard afterward that she went out to India later, quite well, having gained more than fourteen pounds in weight, but she relapsed again after a while, as such cases seem liable to do.

I will only burden you with this one case; but remember that I could give you case after case of the same kind, and that is one of the points I wish to make—it is a very, very common ailment.

The next point is, How are these cases brought about? A matter, I think, of the simplest physiology imaginable. These patients are invariably of a neurotic temperament, and in evidence of this I may point to the fact that the disease is almost entirely confined to the female sex, while other well-marked evidence may usually be found in neuralgia, flushings, faintings, etc. The point of this is, as it seems to me, that neurotic people are very commonly people of slow digestion. This is as much so in men as in women, but men very seldom take on this peculiar type of disease; they, for some reason or other, become hypochondriacs and over-critical as regards their intakes and their outputs, and particularly irritating to the medical mind by the very unnecessary detail into which they launch as regards the quantity and color of their fecal evacuations. In this respect, and also in their greater resistance to treatment, men are far less satisfactory patients than women. The neurotic of slow digestion suffers much from flatulence and its consequent distention, and, no doubt, digestion is to them a rather distressful process. The next step is that these people think that they have got the disease "indigestion," and as a very natural result they consult a doctor, and that appears, in a large number of cases, to be the very worst thing that they could do. And why? Because they are thereby confirmed in their belief that they *have* got indigestion. They *thought* they had before—that was bad enough; now they have authority for their belief, and they are on the straight road to perdition.

Having got indigestion they must, of course, diet themselves; perhaps they are already dieted by authority, but, if not, they very readily take to dieting themselves; and first one thing is left off and then another, as, failing to get relief, they still think they are taxing their stomachs

fastidiousness will speedily drive you crazy; and it is very seldom indeed, although they vow they can never digest milk, that, under the altered circumstances in which they now find themselves, it disagrees with them in any way. Milk is the thing to begin upon, and cream may almost immediately be added to it. It is true, they will say the same of cream as they do of milk: it is bilious, etc. You can retort that even babies can digest it, so certainly they can; and, indeed, for weak stomachs of all kinds there are few things better than cream. Pounded meat and vegetables come next, and so on, according to all the details that have been so well advocated by Weir Mitchell.

There yet remain one or two little points in the management of these cases, and the first is to make them understand that in the generally lengthened process of fasting to which they have subjected themselves the cavity of the stomach has probably *contracted*, and that our process of stomach-stretching is not one that can be carried out without some little discomfort—indeed, I have no doubt that it sometimes causes a good deal of pain to the patient, so far as an outsider is able to gauge the degree of pain from which a neuralgic individual is suffering. Further, they must understand that a certain amount of distention of the stomach after food will be their lot through life, more particularly when their general health is rather low or they have been overdone or worried in any way. We are all familiar with that fact. Large numbers of people go about who habitually feel some slight fulness after food for an hour or two, and which subsides after that time, as the stomach settles down to its work and disposes of some of it. But to those of us who are robust, or know that it means little, it gives no trouble; it is only those who dwell upon it that it depresses and makes miserable. The next point is, that from the fixed idea that these people have as regards the injurious effects of certain foods upon their very particular food-bags, it is absolutely necessary to put them under the charge of a properly trained nurse and often to take them away from home. This latter part of the Weir Mitchell treatment may possibly be unnecessary, for they are for the most part intelligent and wanting to get well if only they can be shown how health is to be accomplished; but a nurse is an absolute necessity.

Having got the case thus far on her road of recovery there will come up, probably, the individuality of the patient, and with it a rather nice point to determine, viz., how much food a particular patient requires. We vary so much in this respect; and I believe it is the women who have habitually small appetites who supply the large majority of the sufferers I talk of—people who never have any desire for food, and who, measuring their needs by this low standard, gradually eat less and less, until they collapse. The rule of the life of such a one must be to try

worked or overdone: "Too tired to eat," we exclaim. In either case the bodily vigor has run too low, the nervous energy requisite for a healthy digestion is not forthcoming; therefore, the appetite is wanting, and food, if forced into the stomach, is only too likely to disagree. It is just so with these cases: they may have a sufficient flow of nervous energy to keep up appearances, just as a raving lunatic may be enabled to put forth an amount of energy which would not have been deemed possible by his associates, and then collapse after it; but they are always tired, and by so doing there is nothing left to charge the abdominal viscera. Hence, the flatulence, the distention, the pain, the indigestion, the constipation, etc.—the stomach is too tired to do its work. But, instead of thus going to the root of the matter, its work is made easier for it, either by diminishing the amount of food introduced or by pre-digesting what is presented to it, or by both combined. But the stomach is only a bit of human nature, and like its master—or its servant, rather, in this case—if its work is habitually made easy for it and it has little to do, it very readily accommodates itself to its altered circumstances. It would be unkind, indeed, of us to quarrel with it for taking advantage of the proffered ease, when it is so very good-tempered and bears so very uncomplainingly all the many indiscretions to which it is subjected in the opposite direction; and it gets small and lazy—a physiological sloth only—from having nothing to do. And unless you can dispute my fact that these cases are made worse by the advice that they too usually receive, which I do not think to be possible, the explanation of it seems to be patent. Of course they are; for to lessen the work is to accentuate the bad habit into which the organ has been allowed to drift. Clearly, then, the proper treatment of such cases is to restore the nervous energy of these patients, and, having done that, to gradually tax the stomach more and more, until by gradual efforts it is able to remove mountains.

To do all this it is absolutely necessary to send the patient to bed for some little time. It is clearly not conducive to successful treatment to allow her to waste or fritter away the little energy she has by dragging about in the dilapidated state of tissues in which we find her. All the vitality she has is wanted to be concentrated on her blood-making supplies; all waste, therefore, is to be curtailed, all possible energy husbanded, by keeping her in bed. Next comes, I was going to say, food; but I think medicine comes next in natural order, and *that*, *not* hismuth or remedies directed to any local failure, but strychnine and iron, as helping to restore the vitality of the patient. Then shall come food—and food which, although carefully adapted to the enfeebled organ, shall nevertheless be gradually and methodically increased, both in quantity and variety, until the healthy standard is again reached. Very little attention must be paid to the patient's suggestions in this matter; their

Very different, however, are the symptoms so frequently elicited by pressure. Here the patient distinctly reacts in a manner that unmistakably indicates pain. At the outset, however, we must distinguish between two groups of symptoms radically different in their meaning and which are elicited according to whether the pressure is superficial or deep. In the first group we have the well-known tender spots of so-called spinal anæmia or spinal irritation and which are now recognized as being related to purely functional conditions. As is well known, they are elicited by comparatively slight pressure and most frequently over the dorsal and cervical spine; and further, in the vast majority of cases the area of tenderness is small and distinctly limited. Whatever speculation we may indulge in as to their nature, whether we regard them as expressive of some nutritive or functional change in deeper structures or relegate them to the great group of the inexplicables of hysteria, there can be no doubt that these painful areas are genuine. If, without telling the patient just what is being done or what drug is being used, an injection of cocaine be made into a painful spot, the latter, in the fraction of a minute or longer, disappears. At the same time, the painful spots above and below not so treated remain unchanged. Surely upon this and other grounds the inference is justified that we have an actual, a *bona fide*, condition to deal with.

Without pausing to assign this symptom its proper place in the syndrome of railway spine, let us pass at once to the consideration of the symptoms elicited by *deep* pressure. In a large number of cases pain is not complained of unless the pressure made is decided. Care should, of course, be exercised in examining with deep pressure not to cause pain in the superficial structures, especially the skin. This can readily be avoided by pressing with the thumb, and, further, not with the point of the thumb but with its palmar surface. One would, of course, not think of using a pointed instrument or the knuckles in making this test.

The pain elicited on deep pressure differs, I need hardly point out, altogether from that elicited by superficial pressure. In the first place it differs in character. It lacks the acute sensitiveness of the painful spot. The patient reacts later and less suddenly. It utterly fails to resemble hyperæsthesia, which the painful spot in some of its features approaches. Secondly, it is more diffused, and instead of being found directly over the spine it is more apt to be found, and for some little distance, on one or both sides. Lastly, it very frequently bears in its position a distinct relation to the history of the accident. This I can best illustrate by citing one or two cases.

CASE I.—A healthy young woman of twenty-four, while standing in a railway station, was struck by the pole of a loaded baggage truck. The truck was being pushed very rapidly and the end of the pole struck

and take, meal by meal, some slight increase on the previous one, until the power to eat is cultivated.

Massage is useful as a restorative to the peripheral circulation and to the muscles, but it is not absolutely necessary.

THE BACK IN RAILWAY SPINE.¹

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So much has been written upon railway injuries that it is not without some hesitation that I write upon this subject. It has, however, seemed to me that the physical condition of the back has been insufficiently discussed. Certainly far more has been said pro and con upon injuries of the spinal contents, and far more still upon the subject of traumatic neuroses. It has been my fortune to examine a large number of railway and allied injuries, and it has appeared to me that the condition of the back was often poorly understood and often unappreciated, while important points were sometimes entirely overlooked. Further, conditions are occasionally observed which are difficult of explanation, and to these I especially desire to call your attention.

At the outset of our inquiry, we are met with the problem as to what extent pain, a subjective symptom, should be admitted as a factor. We all know that pain of various kinds is met with in railway cases. Now it has seemed to me that we should exclude from this discussion all pains the existence of which cannot be confirmed by any physical evidence, and which rest solely upon the unsupported statements of the patient. Under this head come the vague aches, "weak feelings," and paræsthesias which may be absolutely genuine, but for the demonstration of which there are no known means.

On the other hand, all pain, signs of which are evoked without previous warning or suggestion, should be rigidly admitted. Under this head come all pains signs of which are evoked during palpation, pressure, percussion, and motion, either voluntary or passive.

To begin, it is impossible to separate sharply the symptoms elicited by palpation from those elicited by pressure. Curiously enough too, the very first symptom that presents itself for our consideration, namely, abnormal sensitiveness of the surface, or hyperæsthesia, constitutes a borderland symptom between the subjective and objective groups, the exact significance and value of which it is impossible to fix, and for the present, at least, this symptom must be set aside.

¹ Read before the New York Neurological Society, May 5, 1891.

is, the jarring produced by slight though very rapid blows—may be of decided value in cases otherwise obscure.

Having briefly touched upon the examination of patients by palpation, pressure and percussion, let us now turn our attention to the important tests by motion.

In regard to pain elicited by voluntary motion the objection may properly be urged that here an opportunity is presented to the malingerer. However, there are, as will be pointed out, so many other means of ascertaining the truth at our disposal that difficulty in arriving at definite conclusions will rarely be experienced. In the first place if there be pain on movement there is an instinctive tendency to prevent all movement. The back is held very stiffly and very frequently indeed the patient adopts peculiar and striking attitudes. (This is well illustrated in Figures 1, 2, 4 and 5.) Further, if the patient complain of pain on voluntary movement, passive movement of the trunk in directions and at times not expected by the patient will generally act as a safe corrective to statements made by him. In addition certain physical conditions of the muscles are apt to be present; namely, the muscles in the painful area and its immediate neighborhood are apt to be in a condition of spasm either continual or coming on at such times when movement either voluntary or passive is attempted. This feature when present is most valuable, as it cannot be simulated and as it does away absolutely with the suspicion of malingering. Finally, the muscles which are in a state of spasm are painful when touched and are also in a condition of heightened reflex irritability.

Much depends upon the manner in which the various tests for motion be applied, and it may not be out of place to consider them in detail. They are flexion forward, lateral flexion, torsion and transmitted shock.

Having first practised palpation and pressure and gleaned such information as can be obtained from these sources, we should closely observe the back as the patient stands before us, supposing of course that he be not paraplegic. He is now directed to bend forward. The points to which our attention should be directed are, the manner in which the act is performed, the amount of motion in the back itself, the stage in the act at which the patient complains of pain, if any, and the area to which the pain is referred, and finally the occurrence of muscular spasm. If rigidity be a marked feature the patient will often merely throw the back forward as one piece, motion taking place only at the hip-joints. (This is well illustrated in Figure 5.) If urged to make a more decided effort, the patient will frequently bend the knees, stoop, adopt, in fact, any expedient that will save the back. In cases less marked the patient will upon urging begin bending the back, but very soon will check the movement, protesting that it gives him pain. Very frequently also decided spasm makes its appearance in the muscles at

her directly between the spinal column and the right shoulder-blade. Two years and three months later, when first examined by me, I still discovered a very painful area upon deep pressure in this region, though I did not until afterward learn that it corresponded to the site of the injury. Superficial painful spots were not present in this case, nor was the patient in the least degree hysterical.

Another instance is the following :

CASE II.—A finely developed man of twenty-seven, a brakeman, was caught between the bumpers while coupling freight cars. His back and left side were badly squeezed, though no bones were broken. Upward of two years later he presented marked pain upon deep pressure in the lower lumbar and upper sacral region, especially toward the left, and in addition deep tenderness over and above the left ilium. Neither hyperæsthesia nor painful spots were present. Both of these patients, I should say, had suffered from shock and still presented some asthenic symptoms.

Without pausing to multiply instances of this symptom or to discuss its meaning, let us pass to the pain elicited by percussion. It is at once evident that pain elicited by percussion is without significance unless both superficial and deep pain upon pressure have been previously taken into account or excluded. Percussion is, of course, best performed with a rubber hammer such as the Madison-Taylor hammer used in studying the knee-jerk. The patient lying prone, extended and relaxed, a number of very rapid and not very hard blows should be made directly over the spine with the point of the hammer, the idea being to elicit pain not by the force of the blows but by the faint though decided jarring produced.

Aside from the fact that this method will frequently elicit pain in the bony structures when other methods either cannot be well applied or result negatively, it is not improbable that even pain having its origin in the spinal canal itself may be brought to light by this means. Two instances in my experience favor this view. One was a man in my care at the Philadelphia Hospital, who fell from a wall some ten feet high, striking upon the lower portion of the back, and who subsequently developed a concussion myelitis. In him pain, absent in this region to other tests, was elicited in the lower dorsal and upper lumbar region by the hammer used in the manner described. The other case was the patient exhibited at the last meeting of the American Neurological Association, held in Philadelphia, who had been cured of paraplegia by the resection of a number of spines and laminæ. In this man pain on percussion was one of the most definite and valuable symptoms present, and in the course of the operation marked inflammation of the dura with adhesions to the subjacent pia were revealed, while the fragments of bone removed appeared healthy. These cases are very suggestive, and it certainly is not improbable that this method of percussion—that

slight impulse is excessive, and needless suffering may be caused. A gentle pull should first be made, and if no response is elicited from the patient a more forcible one may be given.

If it be desired to eliminate the cervical portion of the spine from the problem, the patient may be seated and the impulse be transmitted through the shoulders. On the whole, however, this method will be found less satisfactory than the preceding.

A third method is to direct the patient while standing to raise himself upon the toes and then to let himself fall back heavily upon the heels. This method is also less valuable than the first. A man with a very sore back can absolutely not be made to execute this test properly. At most it should be used as a confirmation of pain elicited by other means.

We have thus far considered, though briefly, the various tests for eliciting pain. Not only is it possible with due care to settle the question of the genuineness of the symptoms by any one of the methods detailed, but it is also evident that there must be a general correspondence in the results of all the methods. We should expect, for instance, that the area of pain upon deep pressure should correspond, other things equal, to the area of pain on motion, or that the region of pain elicited by percussion should correspond to the region of pain elicited by transmitted shock. Admitting then for the present the reality of the symptoms, and without pausing to discuss their probable lesions, let us turn our attention to a few typical instances of the railway back.

CASE III.—J. C. J., colored, aged twenty-nine years, married, and a coachman by occupation, was in good health up to May 3, 1889. On that date, shortly after midnight, while driving an omnibus containing twelve passengers across the tracks of a railroad the vehicle was struck by a fast freight train. The coach was instantly demolished, three passengers killed, and the others more or less injured. Our patient says that he lost consciousness at the moment of the collision. Eight or nine hundred yards from the scene of the accident he was taken off the engine, on the front part of which he had been jammed.

He remained unconscious for five days. Consciousness then gradually returned, but he was for a long time dazed and confused. He felt great pain "all over," but especially in the head. Pain was also marked in the back and in the right shoulder. He also expectorated considerable blood. Little by little he began to improve, but it was not until six weeks after the accident that he was able to leave his bed. The pain in the head and back, however, steadily persisted. He was weak and nervous and could not sleep well. He seemed to improve a little, however, until December, 1889, when he seemed to reach a standstill. Three months later he was examined by the writer and presented the following conditions: When stripped his peculiar attitude was at once noted. (See Fig. 1.) His head and neck were thrown slightly forward and to the left, while the right shoulder was held much lower than the

this time. The spasm, when present, is usually most marked, unless otherwise determined by some detail of the accident, in the lower dorsal and lumbar regions. In cases still less marked than the above forward flexion may be almost completed before pain is complained of or, what is very important, motion may only be restricted in one part of the back. Thus a patient may hold the neck and shoulders very rigidly but flex the lumbar spine quite well, or there may be little or no movement in the lumbar region while the upper part of the spine is flexed considerably.

Supposing now that this test has not yielded decided results or that the patient in his unwillingness to bend the back has opened himself to suspicion, forcible flexion may justifiably be resorted to. Of course the adoption of this procedure depends absolutely on the good sense and judgment of the investigator. We should remember that the pain excited by forcible flexion is often extreme.

We next practise lateral flexion. Here the same points are of course to be observed as in forward flexion. It occasionally happens that in cases where forward flexion has failed to elicit symptoms, the latter are brought to light when the trunk is bent to one or the other side. This generally corresponds to some peculiarity of the accident. For instance, in the case of the brakeman already mentioned who was squeezed between the bumpers of cars, my notes read as follow: "No pain upon forward flexion. Marked pain upon flexion to the right. Pain referred to left side and extending from ilium to lower ribs." It should be remembered that it was the left side especially which had been injured.

Should forward and lateral flexion have failed to elicit symptoms or should the latter have been doubtful, torsion may be practised. An assistant kneeling before the patient should firmly grasp the hips, while the operator, seizing the shoulders, should gently but firmly rotate the trunk. If there be deep-seated soreness the patient will soon give signs of suffering. This method of searching for pain is a powerful one and is rarely of itself required, as most pains are readily elicited by the flexion tests. It may be, however, that in a given case the muscles of the back have suffered less than the fibrous tissues and smaller joints of the spine itself, and in such instances this test may be a very valuable one. While flexion both forward and lateral reacts upon the spine it reacts more powerfully upon the muscles. Torsion, on the other hand, reacts more powerfully upon the spine itself.

We now come to the test by transmitted shock. This may be practised in various ways. The patient standing as erect as possible, the operator places both hands with fingers interlocked on the head and then by a sudden downward pull sends an impulse through the spine. The amount of force exerted must be gauged by the reaction of the patient. The spine may be so very sore that the reaction to even a

No eye symptoms. Eye-grounds normal; no contraction of the visual field.

Patient complained greatly of headache and backache. Slept badly. Frequently had attacks of "terrors" at night during which he felt his heart beating very fast. Also complained much of dizziness, ringing in the ears, and said that he could not get his mind settled. Mentally he was much depressed.

Fig. 1 is based on a photograph taken in March, 1891, and it is seen that much of the original condition still persists. The attitude is still characteristic and muscular spasm and rigidity are still present, though in a lessened degree. The awkwardness of movement in the right arm has largely disappeared. Sensation on the right side is fully up to normal and errors of location are no longer made. There has also been some increase of general strength. Damages were awarded the patient about a year after the accident, but seemed to make no change in his condition other than to greatly improve his spirits.

The condition of the back was in this instance very typical. There was excessive rigidity, muscular spasm, great pain upon pressure and motion, and at the same time many of the general symptoms of persistent nervous shock so common in these cases. Especial attention should be directed to the fact that superficial tenderness was present in this case distinct from pain upon deep pressure.

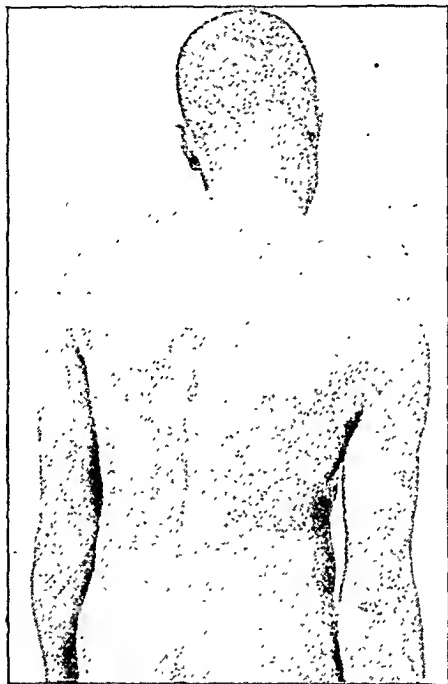
The following constitutes another instance:

CASE IV.—G. T., aged forty-six, single, and an upholsterer by trade; was in good health up to October 22, 1890. On that day he was sitting on the rail of the South Street bridge (Philadelphia). His hat blew off, and letting go his hold upon the rail to catch his hat, he lost his balance and fell a distance of thirty feet upon a mound of earth. He struck upon the back and head, became unconscious and remained so until he found himself in the University Hospital, to which he was removed on the same day. He was at first very much confused and suffered intensely from pains in the back and head, and his entire body seemed to tremble. On October 27th he was transferred to my ward at the Philadelphia Hospital. When first seen by me he walked into the office of the nervous pavilions, walking without assistance. He seemed, however, weak and his steps were evidently shorter and slower than normal. He stripped to the waist without help. He complained of pain in the lower dorsal and lumbar regions, and here deep pressure revealed great soreness. Marked pain was also elicited in this region by flexion, torsion, and transmitted shock. Marked spasm of the muscles in this region was also noted on movement. In addition there was marked tremor of both arms and shoulders. He also complained of headache and seemed much depressed.

He was at once placed in bed on the rest cure. Milk in as large quantities as he could take was given, and for a time massage was attempted, but this had soon, owing to the painful condition of the back, to be abandoned. Instead of improving, however, his symptoms steadily increased in severity. His back became more and more painful. The muscles soon attained a condition of almost constant spasm, and as a consequence rigidity was very marked. The back also became

left. At the same time a huge scar extending transversely along the base of the skull from the right mastoid process to the median line was found. Here, as his physician stated, he had received at the time of the accident a deep lacerated wound. On the right parietal eminence another scar an inch and a half long was also found. It was also noted that in talking he did not turn his head but held it fixedly in the position already described. On touching the back it was found that the muscles, especially to the right of the spinal gutter, in the neck, and to

Fig. 1.



the left in the dorsal region, were swollen and hard. The spine was exquisitely sensitive to superficial pressure, while deep-seated soreness was made out over the muscles on both sides. Great pain was elicited upon attempts at flexion, torsion, and upon transmitted shock. The pain was especially referred to the cervical and the dorsal regions, being worse in the former. All attempts at movement resulted in greatly increasing the muscular spasm. Spasm of the muscles could also be excited by very slight handling. The right shoulder was somewhat painful on motion. There was also marked diminution of the grip on both sides, especially the right; the right hand registering 35, the left 62. In addition there was distinct awkwardness of movement of the right arm and an excessive display of effort. Further sensation was distinctly diminished on the right side as compared with the left and the patient frequently made errors in locating the impression, generally referring the point touched, if, say, on the middle phalanx of the finger, to the proximal phalanx; or if on the proximal phalanx, to the metacarpus, and so on. Knee-jerks at first exaggerated, but soon exhausted.

very much. Whether there was here a psychic element at play, or whether the effort caused the spasm to radiate to the chest muscles and perhaps also the diaphragm, it is impossible to say. The latter view, however, seems to me to be the more probable.

The slight improvement in the patient's condition noted in February has continued up to the present time. The patient, as a whole, is stronger, sweating is less marked; he is able to get out of bed and take a few steps without assistance. The rigidity of the back, though still present, is evidently diminished. Muscular spasm is, however, marked in the lumbar region and the muscles still show excessive reflex excitability. Superficial spinal tenderness has largely disappeared, but pain on deep pressure is still present. Knee-jerks still exaggerated. Sensation in feet and legs up to normal. Difficulty of emptying bladder; though lessened, still persists. Mentally the patient has much improved and when last seen was quite bright and cheerful.

The absence of litigation makes this case an exceedingly valuable one. In a number of its features, too, it is unusually interesting and instructive. The fact that this patient steadily grew worse for almost five weeks, and this, too, in the face of absolute rest and forced feeding, is very remarkable. In spite of everything, his spasm, pain, rigidity and asthenia steadily increased. It is somewhat difficult to frame an explanation, but the fact must be admitted. He is still in bed. Eye symptoms, it should have been stated, were not present. There was no contraction of the visual field.

CASE V.—A case somewhat similar is that of B. W., aged forty-two years, married, and a carpenter and builder by trade, who presented himself at the University Hospital, December 5, 1890. Last June, while erecting a barn, he was struck by a large rafter in the middle of the back, knocking him down and pinning him to the earth. He was unconscious for a few minutes and later on was sick at his stomach. Vomiting occurred repeatedly during the next four days, the vomit occasionally containing blood. During this time he was not confined to the house, but continued outside directing his men at their work. He said, however, that he felt giddy and was afraid to climb to a height. His back, too, felt quite sore. About a week after the accident he began to be troubled with headache, while the giddiness became more and more marked. The soreness now spread all along his spine. His physician, who accompanied him to the hospital, said that pressure upon the spine now made him sick at the stomach and also caused his face to flush. He was obliged to remain in-doors. He was unable to collect his thoughts, could not concentrate his attention upon anything. Slept badly, at night was restless and "delirious." He had also become very weak.

Examination disclosed marked rigidity of the spinal column, excessive spasm and tremor of apparently all the muscles of the back, great pain on pressure, especially at the site of the injury; pain on movement in any direction; knee-jerks exaggerated on both sides; ankle clonus present in both feet; paradoxical contraction of tibialis anticus; excessive sweating and occasional flushing of the face. Mentally the man did not seem much depressed. He was bothered about

sensitive to superficial pressure. Excessive sweating also set in. Tremor became more pronounced than ever. Four weeks after admission his symptoms had attained their height. The man was thoroughly and abjectly miserable. He was excessively depressed, cried easily, complained of headache, said that he could not sleep, dreamed sometimes that he was falling again from the bridge, had ringing of bells and hissing noises in his ears, trembled worse than ever, had difficulty in passing his water, frequently had sharp pains shooting through his back and head and even in his abdomen. In addition there was now decided loss of sensation in both feet and he was utterly unable to stand. His weakness was extreme. Sweating was excessive. Bowels constipated. Knee-jerks were much exaggerated.

He remained in this condition with but little change until the latter part of February. He was now able, though at the expense of great suffering, to sit up long enough to permit his being photographed. (See Fig. 2.) Afterward he was immediately returned to bed. The photo-

Fig. 2.



graph, though taken under the disadvantages of the diffused daylight of a hospital ward, shows, beside the peculiar attitude adopted by the patient, the spasm in the muscles. This spasm I should say had radiated to all the muscles of the back and even of the shoulder. An important symptom closely related to this spasm, and which should have been mentioned before, is the fact that the man spoke with great difficulty. His speech was short and jerky and seemed to give him pain in the back. It evidently caused him considerable effort and tired him

be catheterized, while his bowels were obstinately constipated. He was confined to the house, in bed and out, for a period of eight weeks.

He was first examined on May 7, 1890, a year after the accident. He complained of constant pain in the head and back. The spine was excessively rigid and very sensitive to superficial pressure. General surface of the back hyperæsthetic. Great soreness to deep pressure in small of back. Pain in this region on flexion, torsion, and transmitted shock. Slight lateral curvature to the right. Decided spasm of the lumbar muscles on the left side. Reflex excitability of the muscles of the back generally, very great. Excessive knee-jerk and ankle clonus on both sides. Cremaster and abdominal reflexes likewise excessive. Chin reflex also elicited. Patient appears to be very weak. Grip much below normal and very tremulous. Both legs weak. Patient limps badly with the left foot. The instep is evidently very painful; the foot had been wrenched or badly bruised. Sensation appears to be everywhere good, though patient occasionally makes errors of location.

He cannot work, cannot think clearly, cannot fasten his attention. Worries and feels badly. Is very low-spirited. Sleeps poorly, and dreams occasionally frightful dreams in which the horror of the accident recurs. At those times his heart beats very fast. Has at times ringing in the ears. Pupils large and very mobile. Visual field much contracted for both eyes.

I have had occasion to see this patient at intervals ever since, and repeatedly confirmed the above notes. On a number of occasions he had convulsions, during which he appeared to be oblivious of his surroundings. During the attack he would imagine that the accident was again occurring and he would cry out, "It is coming! it is coming!" evidently meaning the engine, and would be in a perfect paroxysm of fear. From descriptions that I obtained I judged the attacks to be distinctly hysterical.

The following case (Case VII., Figs. 4 and 5) presented mental symptoms probably hysterical in nature, associated with a *bona fide* railway back.

CASE VII.—G. H., aged forty-two, married, a carpenter by trade, was in good health at the time of his accident, which occurred May 24, 1889. He was seated in the rear end of a rear car of a train which was standing at a station. He was leaning forward and turning to the left when another car, which was being added to the train, struck the car in which he was seated with great force. His head and shoulders were violently jerked backward. He instantly felt great pain in his back and cried out, "My God, my back!" He supported his back with his hands, remained on the train a short while until his destination was reached and then tried to work. However he was soon obliged to give up the attempt, for whenever he tried to use his saw or his plane the pain in his back became unbearable. On the next day he made another ineffectual attempt to work. He persevered for two hours and a half and was then forced to lie down for the balance of the day. The next day was spent altogether in lying down, and from this time on he made ineffectual attempts at working, working fractions of some days and on others not at all until July, when he was obliged to desist altogether.

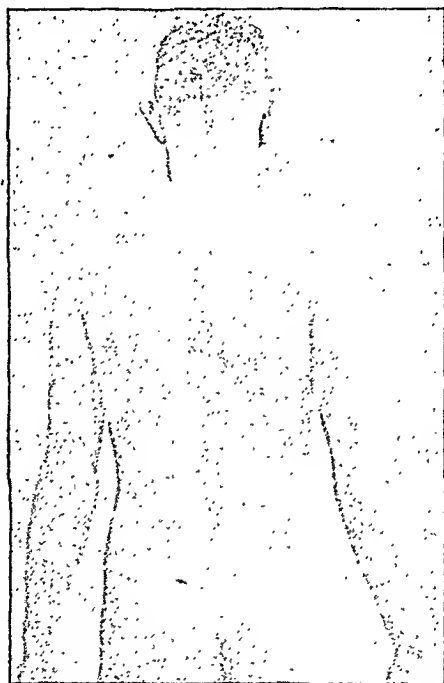
not being able to conduct his business, but otherwise seemed to take his condition quite philosophically.

This case is also interesting, because of the delay in the maximum onset of symptoms and also because of the bloody vomit. In accordance with our suggestion his physician placed him on the rest cure, and at last accounts he was considerably improved though still in bed. There was, of course, no element of litigation.

All three of these cases are interesting because of the entire absence of symptoms usually relegated to the domain of hysteria. In the following case, however, distinct hysterical symptoms are added.

CASE VI.—(See Fig. 3.) H. M. G., aged twenty-three years, an employé in a rolling-mill; was in good health up to May 3, 1889. He was injured on that date in the same accident as J. C. J., the colored man

Fig. 3.



whose case has already been detailed. (See Case III.) He was sitting beside the colored man on the driver's box when the omnibus was struck by the engine. The last thing he remembers is the fact that they were crossing the railroad track. He then lost consciousness and some time later found himself lying on the platform of the adjacent station. Was confused but remembers that he asked to be taken home. That night he was very nervous and excited and continually imagined that "the train was coming on him." Had great pain in the head and back; could not move at all on account of it. For several days afterward he was "absent and bewildered." He could not pass his urine and had to

A remarkable and striking peculiarity of this patient is the difficulty he has in talking. His speech reminds one somewhat of the man who fell from the bridge, Case IV. It likewise is short and jerky and is evidently related, as in Case IV., to the spasm of the back muscles. If the man is in a condition of relative repose, the words can readily be understood and are merely uttered in a sharp, explosive manner. If, however, the spasm of the back muscles be increased by movement or by handling, the speech becomes so jerky as to be practically unintelligible, and indeed the patient is often compelled to desist from the

Fig 5.



effort. It is exceedingly probable that this condition is owing to the fact that the spasm may radiate from one group of muscles to another and thus involve the chest and abdominal muscles. The involvement of the abdominal muscles is, by the way, quite evident at times. Further, when we reflect that the crura of the diaphragm arise from the very region of the spinal column which is proven by other tests to be the seat of the sprain, it becomes evident how readily the diaphragm might itself be affected with spasm, and this I believe, indeed, in the present instance, to be the case.

This patient, together with Case VI., resembles Cases III., IV. and V. very closely as regards the condition of the back and the associated symptoms of general asthenia. The fact, however, of the occurrence of the hysterical convulsions introduces another element to which full weight should be given. Regarding the physical condition of the back, however, let me repeat, there can be no doubt in either case.

I do not desire to tire by multiplying records and descriptions, but before entering into a discussion of the general questions involved, I will briefly present another case because of a condition not noted in the

From September to December of the same year he again managed to work fractions of days, but always at the expense of great pain. Since that time he has been unable to work a stroke. He had grown decidedly worse. Was very weak and nervous, while his back was more painful than ever. He became very despondent and his appetite became very poor. He continued in this condition with but little or no change until February, 1891, when he had an attack of great mental excitement resembling mania, during which he manifested persecutory delusions and attempted suicide. The attack lasted from ten to twelve days, when depression again supervened. He became perfectly rational, but failed to remember any of the occurrences of the interim. Since this time he has had a number of convulsions which, from their description, were evidently hysterical in character.

Examined in March last he presented the following symptoms: His face is drawn and flat. Pupils excessively dilated. Eyebrows elevated and brow wrinkled, giving peculiar expression to face. Patient walks in

FIG. 4.



a peculiar manner, carrying his trunk very stiffly and supporting the small of the back with both hands. (See Fig. 4.) He rocks from side to side, throwing the right leg out and forward and slightly dragging the left.

The spine is exquisitely sensitive to superficial pressure, and deep pressure causes apparently intense pain. The muscles, especially in the lumbar region, appear to be very sore and in a condition of constant spasm. On handling them the spasm increases in severity and is evidently very painful. It is most marked on the right side. It is impossible to get the patient to flex the spine. He simply leans forward in the manner illustrated in Figure 5. Transmitted shock also elicits pain in the lumbar region. Knee-jerks plus on both sides, but readily exhausted. No anæsthesia. Bowels constipated; urine voided with much effort.

addition there was marked general weakness. The grip was weak and tremulous and there was also decided weakness of both legs, especially the right. Weakness, however, was not by any means confined to the extremities, but was also marked in the truncal muscles. (See Fig. 6.) The weakness of the back muscles was indeed so decided as to give rise to marked lordosis, and to this condition I desire particularly to call attention. Rigidity was not a marked feature at the time of the examination, and spasm was only excited by motion. When left to themselves the muscles everywhere became relaxed, resulting in the condition mentioned.

The associated symptoms in the case were similar to those already familiar, and need hardly be mentioned. There were present exaggerated knee-jerks and ankle clonus, while a chin reflex was also elicited which curiously enough involved in its response a contraction of the platysma myoides. No marked sensory symptoms. Mental condition that of depression. Sleep bad and frequently interrupted by the desire of voiding the urine. Frequent micturition a constant and distressing symptom. Urine free from sugar, but perhaps a little increased in amount. Sexual desire and power in abeyance.

Damages were awarded this man in November of 1887. In February, 1889, almost two years after the accident, I examined him again. There was no material change in his condition. There had been some gain in weight and there was much improvement in his mental condition, but pain in the back and muscular spasm were elicited as before. The reflexes were still exaggerated and ankle clonus was still present. The chin reflex, however, was less readily elicited than before. There had been some gain in general strength, but he was still unable to work more than two hours a day. Frequent micturition still present and necessitating his rising four or five times at night.

On May 29, 1890, he was again examined, as also in March, 1891, when the photograph was made (see Fig. 6), now fully four years after the accident. Little change has taken place in his condition. The pain in the back on flexion is somewhat lessened, though forced flexion provokes muscular spasm as of old. Pain can still be elicited by torsion and transmitted shock. The reflexes are still exaggerated, though less so than formerly. Micturition, however, is still as frequent as ever. General asthenia is still very marked, and, as he tells me, he still spends the greater portion of his time in lying down. Lordosis is perhaps a little less marked than formerly, though, as seen in the figure, still very evident.

The various symptoms presented by the six cases I have instanced can be conveniently grouped as follows: First, those due to the physical condition of the back; second, the symptoms of functional derangement and asthenia; third, psychic and hysterical symptoms. To the first group belong—first, pain on deep pressure; second, pain on motion and transmitted shock; third, muscular spasm and rigidity; fourth, muscular weakness.

Now the pain elicited by pressure, motion, or shock is evidently the result of a deep-seated injury either to the ligaments of the spinal column or to the muscles, probably to both. Practically it is impossible

others, and because of the valuable lesson it teaches as regards the possible duration of the railway back.

CASE VIII.—F. W. S., male, aged twenty-seven years, married, a barber by trade; was injured February 23, 1887, during a collision between two street cars, the latter pursuing routes at right angles to one another. The collision was so violent that the car in which our patient was sitting was derailed and thrown over to the curbstone of the sidewalk, while his position was such that the full force of the blow was

FIG. 6.



received by his back. He was thrown violently to the opposite side of the car while another passenger fell with and upon him. He was not rendered unconscious, but got up and walked to a neighboring store. He stood waiting for about three minutes and then boarded another car on which he rode about a mile. On leaving this car he became faint and weak and had to cling to surrounding objects for support. He was finally assisted to his home by a stranger and at once went to bed. Here he remained for six weeks. Backache, headache, disturbed sleep, and frequent micturition were symptoms from which he suffered.

He was first examined November 11th of the same year. Flexion, torsion, and transmitted shock, as well as pressure, elicited pain in the lumbar region. Marked muscular spasm was also noted on motion. In

ences of opinion may obtain. However, taking the cases I have presented it is evident that chronicity must be admitted as established beyond cavil. Case IV., the man who fell from the bridge, has now been six months in bed and though somewhat improved is far from well. Case V. is now of ten months' duration and is still under treatment. Neither case involves litigation. Cases III. and VI. have each received damages, and yet two years after the accident, though slightly improved, each preserves the prominent features previously present. Case VII. is, I believe, still unsettled. However, it is improbable that anyone qualified to judge would fail to recognize the physical condition of the back. This, at the end of two years, is still very marked. Finally, Case VIII. still presents at the end of four years the more important points fully intact. Some improvement must be admitted with regard to all of them, and yet the photographs taken, all very recently, speak for themselves.

In regard to the disappearance of so-called "litigation symptoms," made so much of by Page and others, my observation has been that when a claim for damages has been settled, the mental condition improves very much. A man who, perhaps, is poor is suddenly raised to a condition of relative wealth. No wonder that hypochondria often disappears and is replaced by buoyancy and exaltation. It were strange indeed if it were otherwise. After a while, however, I have seen the old mental condition partly reestablish itself while the physical condition had undergone no change save that which could be accounted for by the slow repair of time.

Lastly, the cases which I have presented were selected because of the marked and pronounced condition of the back. I do not, however, wish to create the impression that every case should present the back symptoms to an equal degree in order to be considered genuine. As a matter of fact, in a large number of instances of *bona fide* railway back the symptoms are far less evident than in the cases here detailed. To cite illustrations would add unnecessarily to the length of this paper. I will simply repeat that careful application of the various tests for eliciting pain and spasm cannot fail to evoke a reply if trauma be really present.

INOCULATIONS FOR YELLOW FEVER BY MEANS OF CONTAMINATED MOSQUITOES.

BY CHARLES FINLAY, M.D.,
OF HAVANA.

At the time when my former article was written¹ I observed that the figures there given were not considered by me, "from a statistical point

¹ "Yellow Fever: Its Transmission by Means of the *Culex* Mosquito." AMERICAN JOURNAL OF THE MEDICAL SCIENCES, October, 1886, p. 395.

to differentiate between the two, nor is it important. We should remember, in thinking of the muscles, that they are normally in a state of tension, especially when the trunk is erect. Indeed, the physical condition presented is that of a bow with many strings. It is not difficult to understand how, under these circumstances, jars and blows should cause serious though perhaps minute strains of the muscles, especially in their tendinous insertions, and these, as we know, are excessively numerous. Further, it is not impossible that at times even the intervertebral cartilages and the joints formed by the articular processes may be the seat of sprain. I should certainly regard this probable in cases that reacted inordinately to transmitted shock and torsion.

To muscular spasm and rigidity are to be assigned the same value which is assigned to the muscular spasm observed in a sprained, a dislocated; or a broken limb. The muscular weakness, resulting occasionally in lordosis, is to be ascribed to the general weakness resulting from the shock and also to the direct effect of the trauma upon the muscles themselves.

To the group of symptoms of functional derangements and asthenia belong of course the various symptoms of general weakness, both mental and physical, tremor, sweating, inability to properly expel or to retain the urine, etc., but it is not our business to deal with them here.

To the group of psychic and hysterical symptoms we must of course relegate the hypochondria, the night terrors and the convulsions. These likewise it is not our business to discuss.

One important problem, however, still presents itself. Why is it that some of these cases do not attain their maximum severity for days and weeks after the accident? This was especially illustrated in Cases IV. and V. Both of these men suffered comparatively little at first, but after a time the symptoms were of the most pronounced character. I confess that this problem is somewhat difficult to answer. It has, however, seemed to me exceedingly probable that there was here a direct extension of inflammation from the original site of the trauma along the sheaths and tendons of the muscles. It is difficult to escape from this inference, inasmuch as there was a marked spread in the area of pain on deep pressure. Hand-in-hand with this there is beyond all doubt a radiation in the muscular spasm, a radiation too which may reach not only muscles immediately adjacent, but those even relatively remote, such as the muscles of the abdomen or the muscles of the shoulder.

Before closing I desire to touch on a point of great practical importance. We are almost invariably asked as to the probable duration of the symptoms and as to the prospect of entire recovery. Of course, an absolutely definite answer can never be given. It is a question of probability and of degree, and therefore one in which legitimate differ-

that we should carry our scientific zeal to the point of seeking, through a bolder application of our inoculations, to determine a violent attack of the disease—thereby carrying conviction, no doubt, to the sceptical mind, but at the risk of having betrayed the confidence placed in us.

A somewhat specious objection was recently raised against our mosquito-inoculations, on the plea that the proboscis of the insect not being susceptible of sterilization many accidental germs might be inoculated together with or instead of those of yellow fever, supposing the latter to exist in the proboscis of the contaminated mosquito. To this hypothetical imputation I can oppose many facts. In none of our numerous inoculations has such an occurrence been observed, nor has it ever been proved that the acclimated inhabitants who are constantly being stung by those insects acquire thereby any specific infection. I have on several occasions introduced into sterilized tubes provided with agar jelly mosquitoes that had stung acclimated persons. In most of these experiments, after several days' confinement, the insect died for want of food, and yet not a single colony appeared upon the jelly; when any growth was developed it mostly consisted of fungi, the spores of which had probably been introduced accidentally while transferring the insect from one tube into another. From this curious result I infer that the insect has some means of rendering its outer surface aseptic, and probably does so through a very peculiar operation which I have often seen it perform. This consists in collecting with its hind or middle legs a secretion expelled from the posterior part of its body, and besmearing very persistently with it every part of its body—legs, wings, head, and proboscis. I also believe that we are justified in admitting that the liquid which the insect employs to lubricate its complicated sting, and which being poured into the wound occasions the painful sensation felt by its victim, must vary in its chemical composition in different species of gnats, thereby accounting for the difference in the sensations occasioned by their sting. It is quite possible, therefore, that the presence of that liquid may constitute in the sting of the culex mosquito an appropriate soil for the development of the yellow fever germ, whereas the same germ would remain sterile in the sting of other species of culex.

Another objection of a clinical character was made to our considering as cases of mild yellow fever the attacks of non-albuminuric fever observed in our inoculated subjects, either within the plausible limits of incubation or later on, with the result of rendering them immune against subsequent attacks of albuminuric yellow fever. To this objection an answer is given by the present statistics themselves, inasmuch as among fifty-six inoculated and non-inoculated subjects mentioned therein and who have resided during periods varying between three and seven consecutive years in the city of Havana, *one-half* have acquired their immunity exclusively through non-albuminuric attacks suffered during

of view, to afford any definite clew either in favor or against the prophylactic value of my inoculations." In fact, neither the number of my experiments nor the length of time during which the parties inoculated had been under observation could at that time justify any scientific deductions. Now, however, the case is different; I have on record a series of sixty-seven persons, including all those whom, in collaboration with Dr. Delgado, I have inoculated since 1881, by means of contaminated mosquitoes, in the manner explained in my previous article. All were Europeans, with few exceptions natives of Spain, young adults recently arrived in Cuba and presenting the usual conditions which imply liability to contract yellow fever. Among the sixty-seven a considerable number, fifty-two, are considered as acclimated, either from the fact that they have resided in the infected quarters of the city of Havana (the old town) during periods varying between three and seven years, or in consideration of their having experienced fevers which are attributed to the yellow fever infection, though of a mild type in the vast majority of the cases. Two parallel groups, one of thirty-three *inoculated* persons and the other of thirty-two *not inoculated*, both offering to all intents and purposes such similarity (as to susceptibility and exposure) as can seldom be obtained, afford a reliable foundation for a fair and unbiassed comparison. I consider, therefore, that the time is now come when some practical inferences may be drawn, and, as far as they go, I am happy to say that they agree with my former expectations.

The statistical method of demonstration is, at best, a tedious and a slow process, but it can boast of great triumphs, such as are recorded in the instances of Jenner and Pasteur, who have had to rely exclusively on its results in order to bring over to their views the balance of scientific opinion and public favor. They represent, moreover, two distinct applications of that method. Jenner vaccinated indiscriminately a vast number of subjects in order to verify subsequently the immunity enjoyed by the majority when exposed to the variolous infection. Pasteur, on the other hand, adopted the system of carefully registering every person inoculated by his method after being bitten by a rabid animal, and afterward comparing the statistical results observed in them with the average proportion of hydrophobic cases developed in the non-inoculated after similar bites. I have chosen Pasteur's plan, believing it to be the more reliable and more applicable to our case. It cannot be denied, however, that, limited as we have been in our field of experiment, our numbers cannot compare with those of the glorious French investigator, nor that we labor under a disadvantage in having to deal with a disease which so far has not been proved to occur, under ordinary circumstances, in lower animals. Thus obliged to confine our investigations to the human species, it could hardly be expected of us

inoculated and twenty-five not inoculated. Of the inoculated none have died of yellow fever, whereas five of the non-inoculated have died of it (one Jesuit and four Carmelites). After deducting from the inoculated thirteen cases still under observation, we have thirty-three inoculated and thirty-three not inoculated members of the same communities, having arrived in the same years as the former, leading the same life and exposed to the same chances of infection.

	Inoculated.	Not inoculated.
Mild acclimation (Groups II., III., IV.)	31 = 94 p. c.	21 = 65½ p. c.
Acclimation with regular yellow fever		
—cured	2 = 6 “	6 = 19 “
Died of yellow fever—none of the in-		
oculated, but of the non-inoculated	... ..	5 = 15½ “
	<hr/> 33	<hr/> 32

The conclusions which the above statistical results, together with the comparative observations, appear to justify are as follows :

1. The inoculations with one or two recently contaminated mosquitoes, in the manner practised by ourselves, is free from danger, inasmuch as the numerous trials which have been made have produced at most (in about 18 per cent. of our cases) a mild attack followed by immunity.

2. We must attribute to the influence of the inoculations with contaminated mosquitoes: 1. The mild acclimation observed in 94 per cent. of our cases, whereas the same desirable result has only occurred, *cæteris paribus*, in 65½ per cent. of the non-inoculated; 2. The reduction of cases of regular yellow fever to the proportion of 6 per cent. instead of 19 per cent.; and 3. That of fatal yellow fever to less than 2 per cent. instead of 15½ per cent., one single death from yellow fever having occurred among the sixty-seven persons inoculated by us since 1881 until the present date.

3. The contaminated mosquitoes appear to lose either partially or completely their contamination after they have stung healthy subjects; whereas the contamination appears to become intensified by successive stings of the same insect on yellow fever patients.

4. The inoculations performed during the colder season should not be considered to afford sufficient protection, but should be repeated on the approach of the hot season.

the first three years after their arrival here. If the objection turned out to be well grounded, it would only prove that what we had considered as a partial immunity had been a complete one in ninety per cent. of our inoculated subjects.

I have distributed our sixty-seven inoculated subjects into six groups:

GROUP I. Fifteen—whose observation is yet incomplete, not having resided three years in Havana, nor experienced any form of yellow fever.

GROUP II. Twelve—who experienced, within a period of days varying between three and twenty-five, after the inoculation, an attack of fever with or without albuminuria.

GROUP III. Twelve—who did *not* experience any pathogenic effects within the twenty-five days following the inoculation, nor any other febrile attack subsequently, that could be referred to the yellow fever infection.

GROUP IV. Twenty-four—who did not experience pathogenic effects within the twenty-five days, but subsequently had fevers of a mild type, either non-albuminuric or with slight or transient albuminuria.

GROUP V. Three—who experienced no pathogenic effects after the inoculation, but were subsequently attacked with regular albuminuric yellow fever (severe in two cases), but recovered.

GROUP VI. One—who not having experienced pathogenic effects after the inoculation, was attacked some months later, and after exposure to an infection of unusual intensity, with fatal yellow fever.

After excluding the fifteen incomplete observations of Group I., fifty-two cases remain to be considered which may be conveniently arranged under three heads:

Mild acclimation (Groups II., III., IV.) . 48 cases = 92.2 per cent.

Acclimation with regular yellow fever—

cured 3 " = 5.9 "

Fatal yellow fever 1 " = 1.9 "

52

The next point was to obtain reliable data for comparison. I was fortunate in receiving from two religious communities placed under my medical charge the authorization to practise my inoculations on such members as would be willing to submit to them. These communities are those of the Jesuit and Carmelite Fathers, established in the city of Havana. Their members are partially renewed almost every year by the arrival of new-comers from Spain to substitute others who have resided several years here. Since 1883, every year except 1885 I have inoculated some of the new-comers, while others did not go through that ordeal. During the period 1883–1890 the Jesuit Fathers have had thirty-six inoculated and seven not, and the Carmelites had thirteen

sidered in a diagnostic way without a thorough knowledge of the amount of urea excreted daily for a long period of time for individual cases. Finally, these cases will show that these membranes are involved in the general disturbances which are now so indefinitely known to be associated with diseased kidneys, by the common knowledge of the clinical and excreted evidence.

PELVIC PERITONITIS.

CASE I.—In January, 1887, I was called to see a woman in great haste on account of some acute pain in the abdomen. She was about twenty-three years of age, well nourished, married; had had no children, or abortions; no history of gonorrhœa or syphilis. For some weeks past had had slight dyspnœa on exertion, with headache. She had no other history of disease and considered herself well to this date, with exceptions noted. Physical examination showed patient in recumbent position with legs flexed on abdomen, suffering from severe pain. Pressure upon the abdomen caused increase of pain. Slight distention of bowels with gas. Examination *per vaginam* of pelvic organs disclosed great tenderness in pelvic floor, with serous effusion, most marked in front and right side of uterus. Patient, after chilly sensations, had now a temperature of 103°; pulse firm and small, beating 120 times per minute. Had slight nausea and the characteristic face. Had been attacked without traumatic or other known cause a few hours before my visit, and was now anxious to be relieved from pain. One-third of a grain of morphia was administered hypodermically and pain was allayed for several hours, after which morphia was taken by mouth to modify pain. The day following my first visit pain still continued more or less intense, unless under the influence of the anodyne. Examination *per vaginam* now disclosed more serous infiltration and consequently a more firm pelvic floor. Within a few days the characteristic "deal board" hardness and fixation of uterus was established and pain began to subside slowly, with frequent exacerbations, and terminated in recovery by slow absorption, which extended over a period of several weeks. At the close of this period patient still complained of headache, slight nausea, dyspnœa on exertion and general weakness, although she had apparently recovered her former health. Examination of her urine at this time showed no albumin or casts, after repeated trials, but the quantity of urea excreted in twenty-four hours ranged from twelve to eighteen grammes within this interval, and patient again, after six months from first attack, and soon after these examinations, lapsed suddenly into her former condition of pain and serous effusion. It now occurred to me that there was an intimate relation between the diminished quantity of urea excreted and this inflammation, as other parts of the history were negative, and in addition to the hypodermic injection of morphia I gave a second hypodermic of pilocarpine, which caused free perspiration, and this was followed by an active saline cathartic, which was repeated within twenty-four hours, and the bowels were thoroughly emptied. After three days of this kind of treatment hostilities on the part of the peritoneum had ceased, and what promised to be a more serious attack than before, terminated thus abruptly. After this experience it was determined to try, as far as possible, to avert another attack by giving attention in the interval to the excretions. Nitro-

UREA AND SEROUS MEMBRANES.

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IT has been known for years and has been a part of the clinical experience of all careful observers in this field, that in chronic Bright's disease, serous membranes in various parts of the body were attacked by inflammations and that these secondary conditions resulted often in the great distress or death of the individual. The pericardium became inflamed, serum accumulated and within a few hours the patient was dead. A sudden peritonitis would develop in an apparently convalescing person and the day of doom had come to the patient. An acute attack of pleurisy would set at rest another slowly tortured with the familiar dropsy, dyspnoea, and fluttering heart. Thus I might review the clinical history of many of these sufferers, and glance briefly at these inflammations in various and often remote parts of the body by way of illustration, but more than this mere mention I deem not necessary.

These inflammations at this time in the disease are doubtless due to a combination of causes, and are generally common factors with the lesion in the kidney. The waste-laden blood is carried to tissues which it has for a long period of time failed to supply with sufficient nourishment, and even the small morsel it now offers is so mixed with the offending excrementitious products that they are not able to assimilate it. The bloodvessels themselves have undergone an atheromatous degeneration that, together with the contracted arteries, causes such increase of blood-pressure that the heart has enlarged and still fails in its irregular efforts to supply the necessary nourishment. No great wonder, then, that these highly vascular and therefore most imposed upon membranes should cry out with pain and even finally succumb.

It is well known from an extended observation both of the clinical features of this disease and of the many carefully recorded tests of the excretions from the kidneys, that the excreted urea which such organs eliminate in constantly diminished quantity is, when taken with the other symptoms, the most reliable guide in diagnosis, even though the patient be passing albumin and casts. It is also known that this same relation holds good in cases not passing albumin and casts, and that the severity of the clinical features of the disease can be determined often by a knowledge of this excrementitious product, after many recorded tests have been made, without the presence of the patient.

The purpose of this paper, therefore, is to recite cases which, to my mind, make clear that serous membranes are not only involved in inflammation during the pronounced evidences of Bright's disease, but that they are often involved seriously before the times of passing albumin and casts, and that these inflammations cannot be properly con-

cases are frequently enough met with, even in a limited private practice, to cause a very serious reflection on the part of the profession.

PERICARDITIS.

CASE III.—In August, 1889, I was called to a man, twenty-six years of age, who was found unconscious in a water closet the previous day; had been seen by other doctors and pronounced a case of morphia poisoning. Patient was of good habits, and had no history of syphilis, rheumatism, or indeed any disease, except a profuse diarrhœa for a day or two previous, for which morphia had been taken. Examination now showed patient to be profoundly unconscious, pupils slightly dilated, pulse 110, respiration 20, slight twitching of muscles in forearm, temperature 100°. Examination of urine showed no albumin or casts, but patient passed only 9.6 grammes of urea in twenty-four hours. Saline cathartics and diuretics soon caused patient to rally, and when otherwise apparently well he still complained of the usual dyspnœa, vertigo, nausea and insomnia at times, and a record of his excretions showed at such times a very small quantity of urea excreted. At no time did he pass albumin or casts, although very frequent examinations were made. Patient was a candymaker, and went to work at his trade, against advice, in a neighboring town in last November. In January of this year he returned to the office again, suffering from what he called a bad cold, which was really another explosion of disease. Records show at this time ten grammes of urea, dyspnœa, vertigo, vomiting, twitching of muscles over body, and within two days pericardium began to fill with fluid, heart beat muffled and 110 times per minute, temperature 101°, respiration 26, dizzy and soon became unconscious, and within the night died. Post-mortem showed chronic interstitial nephritis and pericarditis with extensive effusion.

CASE IV.—This was a man, sixty-five years of age, well nourished; no history of syphilis or rheumatism; had considered himself well until within a few weeks of this consultation. Had had within this time dyspnœa, exhaustion on slight exertion, dizziness, and nausea. Had, at this first visit, a temperature of 102°, pulse 100, which had been preceded by a slight chill. Had slight distress in chest, accompanied by dyspnœa. Examination of the chest revealed an inflamed pericardium with slight effusion. The effusion during the succeeding days became very pronounced and caused quite uncomfortable dyspnœa and interfered with the heart's action. Not wishing to grant the idiopathic origin of this disease in this case and not finding another alternative, I, remembering Case I., examined his urine, to find no albumin or casts but that he passed only eight or ten grammes of urea in twenty-four hours, and that this condition extended over several days, contrary to the rule in idiopathic cases, which pass large quantities of urea. Indeed this case had almost fallen into obscurity by simulating to belong to such a class. Two other attacks followed this one within the following year and were marked by small quantities of excreted urea. The first of these was lighter than the original, and the last was lightest of all. The treatment from the beginning was nitro-glycerin, diuretics, saline cathartics, and sudorifics. The vertigo, general weakness, nausea, and dyspnœa that at first distressed patient during the intervals, gradually subsided, as excretions improved, until patient now considers himself well, as he has not had an attack of pericarditis for almost two years and the other symptoms are almost entirely relieved.

glycerin, saline cathartics, and sudorifics were vigorously used until the normal standard of from twenty-five to thirty-five grammes of urea was excreted daily and the patient so far recovered her health as to claim to be entirely well. At this time she became pregnant, and during the whole of her pregnancy she protested herself well; although I repeatedly inquired concerning her health and warned her of her probable troubles at delivery, she did not feel that she had any distress that she could not easily attribute to her condition. At about the eighth month of gestation I was called to her confinement, and after three hours of fruitless efforts, while the os was yet but slightly dilated, she had the first convulsion and continued unconscious until the child was delivered, having three other convulsions in the interim. At this time the urine showed no albumin or casts, but only 9.6 grammes of urea within twenty-four hours were excreted. Patient recovered rapidly on saline cathartics and former remedies, and since that time, May, 1889, has had but one or two slight attacks of peritoneal pain, and is well, so far as appearance and urinary tests can discover, except having a mitral regurgitant murmur, developed at or near the time of confinement, with slight enlargement of the left side of the heart. As repeated examinations of the chest were made before that time, I know the date of its appearance, and it may be well to state that no history of rheumatism can be obtained.

CASE II.—Mrs. B., aged forty, married, had had five children, no abortions. Had no history of gonorrhœa or syphilis. Had had several attacks of what a physician had called "bad misplacement of the womb," accompanied with very severe pain, before my visit. Attacks extended over several months; she was hardly up until another seizure. Before this visit had not had an attack for a month or six weeks and was in a fair state of general health. Now she had excruciating pain in region of pelvis, with knees flexed against abdomen, with increased pulse and elevated temperature. Examination *per vaginam* revealed a very tender pelvic floor with slight serous effusion on right side of uterus, which advanced from day to day, producing general hardness. As all other causes for this condition were absent, I examined the urine, to find that patient passed only 7.2 grammes of urea in twenty-four hours. Albumin and casts were never found in her urine. In ordinary fever, following acute conditions in other parts of the body, and in cases of pelvic peritonitis from other causes, urea is increased in amount. After anodynes to relieve pain, pilocarpine, saline cathartics and diuretics were used vigorously and patient made a rapid recovery. A careful record of her examinations now shows an ebb in the urea excreted, and a renewal of her former attacks, which gradually grew lighter, until, when she removed from observation, she had not had an attack for almost a year, and was apparently well, excreting from twenty-three to thirty grammes of urea in twenty-four hours.

Two other well-marked cases have come under my observation as still further illustrating these conditions, and I no longer have any doubt of the relation of these factors. One of these cases has had repeated attacks and always at the ebb of urea excretion, promptly recovering under the treatment suggested, and thus can be prevented, for long intervals, from having even slight attacks. I do not want to be considered as saying that any considerable part of the whole number of cases of pelvic peritonitis is due to this cause, but I do mean to say that such

above. Patient has been under observation but two or three weeks, and under saline cathartics, sudorifics, and diuretics, she is rapidly improving and gives promise of walking again soon, after having been confined to the house for over a year, and having been treated for rheumatism by six or seven doctors, with all the nostrums known to the profession, without avail.

ENDARTERITIS.

CASE VI.—In April, 1886, I was called to see a woman, sixty-five years of age, who for several months past had been “gradually growing worse,” as she states. Had now vertigo, blindness, nausea, and general weakness; could not walk about home without great exhaustion. Had no history of either rheumatism or syphilis in herself or parents. Did not drink alcoholic beverages. Had to be in bed at times because of irritable heart and extreme dyspnoea causing much exhaustion. Had intercostal pain and headache at times. Passed at this time but 6.7 grammes of urea in twenty-four hours. On diuretics and saline cathartics patient improved in a short time and was able to do some work and be out of doors. Urea excreted in four months after first visit amounted at one time to twenty-four grammes in twenty-four hours, and patient was comfortably well. In December, 1886, she had another explosion of former symptoms, which came on suddenly, and in addition to old symptoms had delusions and hallucinations. Same treatment again seemed to improve patient, but one night she slipped from the house and drowned herself in the river which flowed near by. Post-mortem showed extensive atheromatous degeneration of bloodvessels in head and many other regions of body. Kidneys were slightly smaller than normal, but gave no more evidence of disease than other organs, and bloodvessels were not as much changed here as elsewhere.

CASE VII.—In September, 1886, I saw a woman, forty-six years of age, who had no history of rheumatism or syphilis; the mother of several healthy children; had been for several months distressed by headache, vertigo, nausea, great dyspnoea upon slight exertion, intercostal neuralgia, and general weakness. Examination of urine at this time showed no albumin or casts, but she passed only 4.1 grammes of urea in twenty-four hours. Within two months she grew apparently better. Passed 19.2 grammes of urea, but passed trace of albumin with casts. Within the year following she developed marked insanity. At this time the radial arteries were atheromatous. The heart was slightly enlarged and with an irregular effort was doing the best service it could. Patient was sent away and died, therefore no post-mortem was made; but I have no reason to doubt the diagnosis.

CASE VIII.—A man, fifty-nine years of age; had always been healthy until about a year previous to my seeing him in July, 1886. Had no history of rheumatism or syphilis. Had healthy family of children. Drank no alcoholic beverages. Had a continuous aching in lumbar and intercostal regions, together with occasional nausea, vomiting, dyspnoea, and vertigo, which had continued for several months with varying severity. Had atheromatous condition of radial and temporal arteries. Passed from 12.7 to 15.2 grammes of urea in twenty-four hours for several weeks. Appetite generally good. After several months in this condition he had a sudden paralysis of left side, and after some months more without relief from symptoms he had another stroke, from which he finally died. No post-mortem, but no question remains of the generally diseased condition of bloodvessels.

Two other well-marked cases of this variety have come under my care with similar results.

ARTHRITIS.

The relation between serous and synovial membranes is so close that I relate two cases of extensive inflammatory conditions in these membranes, as I believe them to be connected with this subject:

CASE V.—A man, twenty-one years of age; had no history of rheumatism in parents; had not had syphilis, gonorrhœa, or any serious illness until four years ago, when the present sickness began; had no bad habits—neither drank nor chewed; married, had healthy child. Had always been a farmer in easy circumstances. Four years ago had an attack of so-called rheumatism, vertigo, and general malaise. Joints of lower extremities at this time were swollen and tender; could not walk for several days, and suffered at times with them. Was treated for rheumatism in a neighboring town, and after several weeks recovered. At the same time dyspnœa and the other symptoms passed off and patient resumed his occupation, occasionally relapsing into the condition of dyspnœa and other similar symptoms. Two years ago he had a similar attack to that first mentioned and it ran an analogous course; apparently recovered, with exceptions of general weakness and dyspnœa on slight exertion. Last January I was consulted and made the following record: Joints of lower extremities slightly tender, but not much swollen, and no concretions on motion. Legs were slightly œdematous between articulations, and this had been much more marked, patient thought, during former attacks. Had marked dyspnœa, dizziness, and nausea. Had insomnia and malaise. Symptoms had been increasing in severity for the past ten days, and he feared one of his former severe attacks. The history caused me to examine the urine. I found neither albumin nor casts, but he was excreting only ten grammes of urea. Heart and other organs healthy, except slight roughness of mitral valves. The treatment before mentioned several times in this paper averted what promised to be a serious attack, and after a few weeks all distressing symptoms were gone and patient considered himself entirely well. All medication for rheumatism had not relieved any of these symptoms promptly, and some remained constantly. Patient went to Nebraska to follow his calling and consequently passed out of my charge. During the summer had another attack, and, from what I can learn from the family of his symptoms, must have died from chronic disease of kidneys, accompanied with many of former symptoms.

Another well-marked case of this kind of inflammation is now under observation—a woman, aged twenty, who has not walked for more than a year. Joints are tender and slightly swollen, but the intervening tissue is much more so. There are no concretions in the joints, no thickening of ends of bones. She has the accompanying symptoms of dyspnœa, nausea, vertigo, and a feeling of general weakness, with pale lips. Muscles are not atrophied; heart, lungs, and other organs healthy. Has no history of rheumatism, syphilis, or gonorrhœa. Parents healthy. Patient has been treated for past three years for these relapsing attacks, and is now an invalid. Examination of urine shows that patient passes but twelve to fourteen grammes of urea daily. No albumin or casts or other evidence of disease of kidneys, save those noted

tional malady, as shown by a morbid condition of the blood, which causes changes in the secreting cells of the kidney, and then finally to changes in bloodvessels in kidneys and other organs. DaCosta and Longstreth believe that there are lesions of the renal nerve plexuses and possibly in other ganglia that should lead finally to these extensive changes in the kidneys. Semmola believes it to be a morbid change in nutrition, and that the kidney changes are due to a constant excretion of albumin. Gull and Dutton believe these extensive changes to be due, as a primary factor, to a fibrosis of the arteries and capillaries. Meigs has made perhaps the most lasting guess by first basing it upon a most worthy study of numerous pathological specimens of arteries from the different classes of these patients, and he inclines to the belief that the initial step is an endarteritis of many or few of the bloodvessels, which in the beginning or after a longer or shorter time may, and probably will, involve the arteries of the kidneys. Thomas believes that some irritating substances in the blood, as alcohol, large quantities of phosphates, urates or uric acid, lead, and oxalates, have a tendency, after a long time, to produce the contracted kidney.

If, now, anyone who has made a careful study of this whole subject, with ample clinical advantages and without bias, should be called upon to decide from these views and many others which might have been named, I am inclined to the belief that no decision could be reached as to who was most nearly in accord with all the observed phenomena of these diseases. The want of a constant sign that would be unvarying in its relation to the clinical evidence on the one hand, and the pathological changes on the other, seems to me to be much more important. It is with this object in view that I have tried to show the intimate relation which seems to exist, under all these varying conditions of this many-sided disease, between the abnormally small amount of urea excreted and these serous inflammations which precede, accompany, and follow Bright's disease. If I should be led to express a purely fanciful notion of this relation, I should be compelled to say, for want of a more plausible explanation, that urea is in some way the cause of these inflammations, or, the cause of the suppression of this excrementitious product causes such inflammations. I am inclined to this view, as the same clinical evidence exists in the patient in a more mild form, but still pronounced, as is well known to exist in some of its forms in toxic conditions resulting from an undeniable uræmia, and because at the other extreme we find this clinical evidence in very close relation to the excreted evidence before any visible sign of inflammation has begun, and are enabled to follow these patients until the first serous invasion has taken place in an apparently healthy, well-nourished, young patient oftentimes, as shown by my tables published in *THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES*, January, 1890.

Three or four other cases with similar histories are upon my records of the past six or seven years, and I have no doubt of the pathological changes underlying these clinical pictures, nor have I grave doubts of the steps leading up to this final fatal conclusion.

CASE IX.—A clergyman, sixty-eight years of age; always an active man; never had any constitutional disease but this. Has always maintained the dignity of his profession, and is the father of several healthy children. About one year ago he began to be dizzy. Had slight dyspnoea on exertion. Has now irregular heart action. Sometimes it beats only forty times per minute for several days in succession, and quite irregularly even then. Has hardened radial arteries, slight vertigo, and insomnia. Passes only twelve to eighteen grains of urea in twenty-four hours. Passes no albumin or casts, and careful physical examination reveals to my mind no other diseased organs or tissues.

This man is still under my care. What can I tell him and his friends will finally befall him? Will he die of apoplexy, Bright's disease, endarteritis, or a combination of these, if no other disease intervene? He evidently is now at the point where all these roads meet, and it is still an open question on which one the fell destroyer will most rapidly make his approach, after he has been retarded as long as possible by the use of drugs. What shall I name this hydra-headed disease? Meigs styles it endarteritis. If in a short time he passes albumin and casts, in accordance with what Bright said many years ago, all practitioners now would unite in calling it Bright's disease. If he die from pericarditis, pleurisy, or peritonitis, without passing albumin or casts, they could not be called secondary to a primary Bright's disease; nor with this general evidence, together with the excreted evidences of ill-health, could we say that these diseases were idiopathic. We therefore need a new name that shall cover these symptoms of disease. We have abandoned dyspnoea, vertigo, and dropsy in our list of diseases, and have placed our outposts but a little further into the darkness which surrounds this whole subject, and now the facts that are brought to light from beyond these distant landmarks are demanding new names for the newly discovered conditions that shall take into account the full connotation of the term. During the time of Bright there were vaguely grouped several acute and chronic affections of the kidneys, which had in common one important characteristic—that the urine contained albumin. Almost every year since that time changes have been made in the classification to more nearly correspond to the pathological conditions, until it was discovered that patients could have otherwise this identical disease without passing albumin, and finally even albumin is beginning to be lost sight of in our rapid march toward the source of all these symptoms.

In endeavoring to find the first departure from health in the direction of these extensive after-changes in vessels, organs, and tissues, many theories have been advanced, and are of importance only so far as they can be incorporated into the clinical conditions of these patients.

George Johnson believes that chronic Bright's disease is a constitu-